HP ProLiant DL385p Gen8 Server Maintenance and Service Guide

Abstract

This guide describes identification and maintenance procedures, diagnostic tools, specifications, and requirements for hardware components and software. This guide is for an experienced service technician. HP assumes you are qualified in the servicing of computer equipment, trained in recognizing hazards in products, and are familiar with weight and stability precautions.

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Customer self repair

HP products are designed with many Customer Self Repair (CSR) parts to minimize repair time and allow for greater flexibility in performing defective parts replacement. If during the diagnosis period HP (or HP service providers or service partners) identifies that the repair can be accomplished by the use of a CSR part, HP will ship that part directly to you for replacement. There are two categories of CSR parts:

- **Mandatory**—Parts for which customer self repair is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.
- **Optional**—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that HP replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.

NOTE: Some HP parts are not designed for customer self repair. In order to satisfy the customer warranty, HP requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

Based on availability and where geography permits, CSR parts will be shipped for next business day delivery. Same day or four-hour delivery may be offered at an additional charge where geography permits. If assistance is required, you can call the HP Technical Support Center and a technician will help you over the telephone. HP specifies in the materials shipped with a replacement CSR part whether a defective part must be returned to HP. In cases where it is required to return the defective part to HP, you must ship the defective part back to HP within a defined period of time, normally five (5) business days. The defective part must be returned with the associated documentation in the provided shipping material. Failure to return the defective part may result in HP billing you for the replacement. With a customer self repair, HP will pay all shipping and part return costs and determine the courier/carrier to be used.

For more information about HP's Customer Self Repair program, contact your local service provider. For the North American program, refer to the HP website (http://www.hp.com/go/selfrepair).

Parts only warranty service

Your HP Limited Warranty may include a parts only warranty service. Under the terms of parts only warranty service, HP will provide replacement parts free of charge.

For parts only warranty service, CSR part replacement is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.

Réparation par le client (CSR)

Les produits HP comportent de nombreuses pièces CSR (Customer Self Repair = réparation par le client) afin de minimiser les délais de réparation et faciliter le remplacement des pièces défectueuses. Si pendant la période de diagnostic, HP (ou ses partenaires ou mainteneurs agréés) détermine que la réparation peut être effectuée à l'aide d'une pièce CSR, HP vous l'envoie directement. Il existe deux catégories de pièces CSR:

Obligatoire - Pièces pour lesquelles la réparation par le client est obligatoire. Si vous demandez à HP de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.

Facultatif - Pièces pour lesquelles la réparation par le client est facultative. Ces pièces sont également conçues pour permettre au client d'effectuer lui-même la réparation. Toutefois, si vous demandez à HP de remplacer ces pièces, l'intervention peut ou non vous être facturée, selon le type de garantie applicable à votre produit.

REMARQUE: Certaines pièces HP ne sont pas conçues pour permettre au client d'effectuer lui-même la réparation. Pour que la garantie puisse s'appliquer, HP exige que le remplacement de la pièce soit effectué par un Mainteneur Agréé. Ces pièces sont identifiées par la mention "Non" dans le Catalogue illustré.

Les pièces CSR sont livrées le jour ouvré suivant, dans la limite des stocks disponibles et selon votre situation géographique. Si votre situation géographique le permet et que vous demandez une livraison le jour même ou dans les 4 heures, celle-ci vous sera facturée. Pour bénéficier d'une assistance téléphonique, appelez le Centre d'assistance technique HP. Dans les documents envoyés avec la pièce de rechange CSR, HP précise s'il est nécessaire de lui retourner la pièce défectueuse. Si c'est le cas, vous devez le faire dans le délai indiqué, généralement cinq (5) jours ouvrés. La pièce et sa documentation doivent être retournées dans l'emballage fourni. Si vous ne retournez pas la pièce défectueuse, HP se réserve le droit de vous facturer les coûts de remplacement. Dans le cas d'une pièce CSR, HP supporte l'ensemble des frais d'expédition et de retour, et détermine la société de courses ou le transporteur à utiliser.

Pour plus d'informations sur le programme CSR de HP, contactez votre Mainteneur Agrée local. Pour plus d'informations sur ce programme en Amérique du Nord, consultez le site Web HP (http://www.hp.com/go/selfrepair).

Service de garantie "pièces seules"

Votre garantie limitée HP peut inclure un service de garantie "pièces seules". Dans ce cas, les pièces de rechange fournies par HP ne sont pas facturées.

Dans le cadre de ce service, la réparation des pièces CSR par le client est obligatoire. Si vous demandez à HP de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.

Riparazione da parte del cliente

Per abbreviare i tempi di riparazione e garantire una maggiore flessibilità nella sostituzione di parti difettose, i prodotti HP sono realizzati con numerosi componenti che possono essere riparati direttamente dal cliente (CSR, Customer Self Repair). Se in fase di diagnostica HP (o un centro di servizi o di assistenza HP) identifica il guasto come riparabile mediante un ricambio CSR, HP lo spedirà direttamente al cliente per la sostituzione. Vi sono due categorie di parti CSR:

Obbligatorie – Parti che devono essere necessariamente riparate dal cliente. Se il cliente ne affida la riparazione ad HP, deve sostenere le spese di spedizione e di manodopera per il servizio.

Opzionali – Parti la cui riparazione da parte del cliente è facoltativa. Si tratta comunque di componenti progettati per questo scopo. Se tuttavia il cliente ne richiede la sostituzione ad HP, potrebbe dover sostenere spese addizionali a seconda del tipo di garanzia previsto per il prodotto.

NOTA: alcuni componenti HP non sono progettati per la riparazione da parte del cliente. Per rispettare la garanzia, HP richiede che queste parti siano sostituite da un centro di assistenza autorizzato. Tali parti sono identificate da un "No" nel Catalogo illustrato dei componenti.

In base alla disponibilità e alla località geografica, le parti CSR vengono spedite con consegna entro il giorno lavorativo seguente. La consegna nel giorno stesso o entro quattro ore è offerta con un supplemento di costo solo in alcune zone. In caso di necessità si può richiedere l'assistenza telefonica di un addetto del centro di supporto tecnico HP. Nel materiale fornito con una parte di ricambio CSR, HP specifica se il cliente deve restituire dei componenti. Qualora sia richiesta la resa ad HP del componente difettoso, lo si deve spedire ad HP entro un determinato periodo di tempo, generalmente cinque (5) giorni lavorativi. Il componente difettoso deve essere restituito con la documentazione associata nell'imballo di spedizione fornito. La mancata restituzione del componente può comportare la fatturazione del ricambio da parte di HP. Nel caso di riparazione da parte del cliente, HP sostiene tutte le spese di spedizione e resa e sceglie il corriere/vettore da utilizzare.

Per ulteriori informazioni sul programma CSR di HP contattare il centro di assistenza di zona. Per il programma in Nord America fare riferimento al sito Web HP (http://www.hp.com/go/selfrepair).

Servizio di garanzia per i soli componenti

La garanzia limitata HP può includere un servizio di garanzia per i soli componenti. Nei termini di garanzia del servizio per i soli componenti, HP fornirà gratuitamente le parti di ricambio.

Per il servizio di garanzia per i soli componenti è obbligatoria la formula CSR che prevede la riparazione da parte del cliente. Se il cliente invece richiede la sostituzione ad HP, dovrà sostenere le spese di spedizione e di manodopera per il servizio.

Customer Self Repair

HP Produkte enthalten viele CSR-Teile (Customer Self Repair), um Reparaturzeiten zu minimieren und höhere Flexibilität beim Austausch defekter Bauteile zu ermöglichen. Wenn HP (oder ein HP Servicepartner) bei der Diagnose feststellt, dass das Produkt mithilfe eines CSR-Teils repariert werden kann, sendet Ihnen HP dieses Bauteil zum Austausch direkt zu. CSR-Teile werden in zwei Kategorien unterteilt:

Zwingend – Teile, für die das Customer Self Repair-Verfahren zwingend vorgegeben ist. Wenn Sie den Austausch dieser Teile von HP vornehmen lassen, werden Ihnen die Anfahrt- und Arbeitskosten für diesen Service berechnet.

Optional – Teile, für die das Customer Self Repair-Verfahren optional ist. Diese Teile sind auch für Customer Self Repair ausgelegt. Wenn Sie jedoch den Austausch dieser Teile von HP vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.

HINWEIS: Einige Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem HP Servicepartner ersetzt werden. Im illustrierten Teilekatalog sind diese Teile mit „No“ bzw. „Nein“ gekennzeichnet.

CSR-Teile werden abhängig von der Verfügbarkeit und vom Lieferziel am folgenden Geschäftstag geliefert. Für bestimmte Standorte ist eine Lieferung am selben Tag oder innerhalb von vier Stunden gegen einen Aufpreis verfügbar. Wenn Sie Hilfe benötigen, können Sie das HP technische Support Center anrufen und sich von einem Mitarbeiter per Telefon helfen lassen. Den Materialien, die mit einem CSR-Ersatzteil geliefert werden, können Sie entnehmen, ob das defekte Teil an HP zurückgeschickt werden muss. Wenn es erforderlich ist, das defekte Teil an HP zurückzuschicken, müssen Sie dies innerhalb eines vorgegebenen Zeitraums tun, in der Regel innerhalb von fünf (5) Geschäftstagen. Das defekte Teil muss mit der zugehörigen Dokumentation in der Verpackung zurückgeschickt werden, die im Lieferumfang enthalten ist. Wenn Sie das

defekte Teil nicht zurückschicken, kann HP Ihnen das Ersatzteil in Rechnung stellen. Im Falle von Customer Self Repair kommt HP für alle Kosten für die Lieferung und Rücksendung auf und bestimmt den Kurier-/Frachtdienst.

Weitere Informationen über das HP Customer Self Repair Programm erhalten Sie von Ihrem Servicepartner vor Ort. Informationen über das CSR-Programm in Nordamerika finden Sie auf der HP Website unter (http://www.hp.com/go/selfrepair).

Parts-only Warranty Service (Garantieservice ausschließlich für Teile)

Ihre HP Garantie umfasst möglicherweise einen Parts-only Warranty Service (Garantieservice ausschließlich für Teile). Gemäß den Bestimmungen des Parts-only Warranty Service stellt HP Ersatzteile kostenlos zur Verfügung.

Für den Parts-only Warranty Service ist das CSR-Verfahren zwingend vorgegeben. Wenn Sie den Austausch dieser Teile von HP vornehmen lassen, werden Ihnen die Anfahrt- und Arbeitskosten für diesen Service berechnet.

Reparaciones del propio cliente

Los productos de HP incluyen muchos componentes que el propio usuario puede reemplazar (*Customer Self Repair*, CSR) para minimizar el tiempo de reparación y ofrecer una mayor flexibilidad a la hora de realizar sustituciones de componentes defectuosos. Si, durante la fase de diagnóstico, HP (o los proveedores o socios de servicio de HP) identifica que una reparación puede llevarse a cabo mediante el uso de un componente CSR, HP le enviará dicho componente directamente para que realice su sustitución. Los componentes CSR se clasifican en dos categorías:

- **Obligatorio:** componentes para los que la reparación por parte del usuario es obligatoria. Si solicita a HP que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.
- **Opcional:** componentes para los que la reparación por parte del usuario es opcional. Estos componentes también están diseñados para que puedan ser reparados por el usuario. Sin embargo, si precisa que HP realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.

NOTA: Algunos componentes no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, HP pone como condición que un proveedor de servicios autorizado realice la sustitución de estos componentes. Dichos componentes se identifican con la palabra "No" en el catálogo ilustrado de componentes.

Según la disponibilidad y la situación geográfica, los componentes CSR se enviarán para que lleguen a su destino al siguiente día laborable. Si la situación geográfica lo permite, se puede solicitar la entrega en el mismo día o en cuatro horas con un coste adicional. Si precisa asistencia técnica, puede llamar al Centro de asistencia técnica de HP y recibirá ayuda telefónica por parte de un técnico. Con el envío de materiales para la sustitución de componentes CSR, HP especificará si los componentes defectuosos deberán devolverse a HP. En aquellos casos en los que sea necesario devolver algún componente a HP, deberá hacerlo en el periodo de tiempo especificado, normalmente cinco días laborables. Los componentes defectuosos deberán devolverse con toda la documentación relacionada y con el embalaje de envío. Si no

enviara el componente defectuoso requerido, HP podrá cobrarle por el de sustitución. En el caso de todas sustituciones que lleve a cabo el cliente, HP se hará cargo de todos los gastos de envío y devolución de componentes y escogerá la empresa de transporte que se utilice para dicho servicio.

Para obtener más información acerca del programa de Reparaciones del propio cliente de HP, póngase en contacto con su proveedor de servicios local. Si está interesado en el programa para Norteamérica, visite la página web de HP siguiente (http://www.hp.com/go/selfrepair).

Servicio de garantía exclusivo de componentes

La garantía limitada de HP puede que incluya un servicio de garantía exclusivo de componentes. Según las condiciones de este servicio exclusivo de componentes, HP le facilitará los componentes de repuesto sin cargo adicional alguno.

Para este servicio de garantía exclusivo de componentes, es obligatoria la sustitución de componentes por parte del usuario (CSR). Si solicita a HP que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.

Customer Self Repair

Veel onderdelen in HP producten zijn door de klant zelf te repareren, waardoor de reparatieduur tot een minimum beperkt kan blijven en de flexibiliteit in het vervangen van defecte onderdelen groter is. Deze onderdelen worden CSR-onderdelen (Customer Self Repair) genoemd. Als HP (of een HP Service Partner) bij de diagnose vaststelt dat de reparatie kan worden uitgevoerd met een CSR-onderdeel, verzendt HP dat onderdeel rechtstreeks naar u, zodat u het defecte onderdeel daarmee kunt vervangen. Er zijn twee categorieën CSR-onderdelen:

Verplicht: Onderdelen waarvoor reparatie door de klant verplicht is. Als u HP verzoekt deze onderdelen voor u te vervangen, worden u voor deze service reiskosten en arbeidsloon in rekening gebracht.

Optioneel: Onderdelen waarvoor reparatie door de klant optioneel is. Ook deze onderdelen zijn ontworpen voor reparatie door de klant. Als u echter HP verzoekt deze onderdelen voor u te vervangen, kunnen daarvoor extra kosten in rekening worden gebracht, afhankelijk van het type garantieservice voor het product.

OPMERKING: Sommige HP onderdelen zijn niet ontwikkeld voor reparatie door de klant. In verband met de garantievoorwaarden moet het onderdeel door een geautoriseerde Service Partner worden vervangen. Deze onderdelen worden in de geïllustreerde onderdelencatalogus aangemerkt met "Nee".

Afhankelijk van de leverbaarheid en de locatie worden CSR-onderdelen verzonden voor levering op de eerstvolgende werkdag. Levering op dezelfde dag of binnen vier uur kan tegen meerkosten worden aangeboden, indien dit mogelijk is gezien de locatie. Indien assistentie gewenst is, belt u een HP Service Partner om via de telefoon technische ondersteuning te ontvangen. HP vermeldt in de documentatie bij het vervangende CSR-onderdeel of het defecte onderdeel aan HP moet worden geretourneerd. Als het defecte onderdeel aan HP moet worden teruggezonden, moet u het defecte onderdeel binnen een bepaalde periode, gewoonlijk vijf (5) werkdagen, retourneren aan HP. Het defecte onderdeel moet met de bijbehorende documentatie worden geretourneerd in het meegeleverde verpakkingsmateriaal. Als u het defecte onderdeel niet terugzendt, kan HP u voor het vervangende onderdeel kosten in rekening brengen. Bij reparatie door de klant betaalt HP alle verzendkosten voor het vervangende en geretourneerde onderdeel en kiest HP zelf welke koerier/transportonderneming hiervoor wordt gebruikt.

Neem contact op met een Service Partner voor meer informatie over het Customer Self Repair programma van HP. Informatie over Service Partners vindt u op de HP website (http://www.hp.com/go/selfrepair).

Garantieservice "Parts Only"

Het is mogelijk dat de HP garantie alleen de garantieservice "Parts Only" omvat. Volgens de bepalingen van de Parts Only garantieservice zal HP kosteloos vervangende onderdelen ter beschikking stellen.

Voor de Parts Only garantieservice is vervanging door CSR-onderdelen verplicht. Als u HP verzoekt deze onderdelen voor u te vervangen, worden u voor deze service reiskosten en arbeidsloon in rekening gebracht.

Reparo feito pelo cliente

Os produtos da HP são projetados com muitas peças para reparo feito pelo cliente (CSR) de modo a minimizar o tempo de reparo e permitir maior flexibilidade na substituição de peças com defeito. Se, durante o período de diagnóstico, a HP (ou fornecedores/parceiros de serviço da HP) concluir que o reparo pode ser efetuado pelo uso de uma peça CSR, a peça de reposição será enviada diretamente ao cliente. Existem duas categorias de peças CSR:

Obrigatória – Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a HP substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.

Opcional – Peças cujo reparo feito pelo cliente é opcional. Essas peças também são projetadas para o reparo feito pelo cliente. No entanto, se desejar que a HP as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.

OBSERVAÇÃO: Algumas peças da HP não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a HP exige que um técnico autorizado substitua a peça. Essas peças estão identificadas com a marca "No" (Não), no catálogo de peças ilustrado.

Conforme a disponibilidade e o local geográfico, as peças CSR serão enviadas no primeiro dia útil após o pedido. Onde as condições geográficas permitirem, a entrega no mesmo dia ou em quatro horas pode ser feita mediante uma taxa adicional. Se precisar de auxílio, entre em contato com o Centro de suporte técnico da HP para que um técnico o ajude por telefone. A HP especifica nos materiais fornecidos com a peça CSR de reposição se a peça com defeito deve ser devolvida à HP. Nos casos em que isso for necessário, é preciso enviar a peça com defeito à HP dentro do período determinado, normalmente cinco (5) dias úteis. A peça com defeito deve ser enviada com a documentação correspondente no material de transporte fornecido. Caso não o faça, a HP poderá cobrar a reposição. Para as peças de reparo feito pelo cliente, a HP paga todas as despesas de transporte e de devolução da peça e determina a transportadora/serviço postal a ser utilizado.

Para obter mais informações sobre o programa de reparo feito pelo cliente da HP, entre em contato com o fornecedor de serviços local. Para o programa norte-americano, visite o site da HP (http://www.hp.com/go/selfrepair).

Serviço de garantia apenas para peças

A garantia limitada da HP pode incluir um serviço de garantia apenas para peças. Segundo os termos do serviço de garantia apenas para peças, a HP fornece as peças de reposição sem cobrar nenhuma taxa.

No caso desse serviço, a substituição de peças CSR é obrigatória. Se desejar que a HP substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.

顧客自己修理保証サービス

修理時間を短縮し、故障部品の交換における高い柔軟性を確保するために、HP製品には多数の顧客自己修理（CSR）部品があります。診断の際に、CSR部品を使用すれば修理ができるとHP（HPまたはHP正規保守代理店）が判断した場合、HPはその部品を直接、お客様に発送し、お客様に交換していただきます。CSR部品には以下の2通りがあります。

- 必須 - 顧客自己修理が必須の部品。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費がお客様に請求されます。
- 任意 - 顧客自己修理が任意である部品。この部品も顧客自己修理用です。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、お買い上げの製品に適用される保証サービス内容の範囲内においては、別途費用を負担していただくことなく保証サービスを受けることができます。

注： HP製品の一部の部品は、顧客自己修理用ではありません。製品の保証を継続するためには、HPまたはHP正規保守代理店による交換作業が必須となります。部品カタログには、当該部品が顧客自己修理除外品である旨が記載されています。

部品供給が可能な場合、地域によっては、CSR部品を翌営業日に届くように発送します。また、地域によっては、追加費用を負担いただくことにより同日または4時間以内に届くように発送することも可能な場合があります。サポートが必要なときは、HPの修理受付窓口に電話していただければ、技術者が電話でアドバイスします。交換用のCSR部品または同梱物には、故障部品をHPに返送する必要があるかどうかが表示されています。故障部品をHPに返送する必要がある場合は、指定期限内（通常は5営業日以内）に故障部品をHPに返送してください。故障部品を返送する場合は、届いた時の梱包箱に関連書類とともに入れてください。故障部品を返送しない場合、HPから部品費用が請求されます。顧客自己修理の際には、HPは送料および部品返送費を全額負担し、使用する宅配便会社や運送会社を指定します。

部品のみ保証サービス

HP保証サービスには、部品のみ保証サービスが適用される場合があります。このサービスでは、交換部品は無償で提供されます。

部品のみ保証サービスにおいては、CSR部品をお客様により交換作業していただくことが必須となります。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費はお客様の負担となります。

客户自行维修

HP 产品提供许多客户自行维修 (CSR) 部件，以尽可能缩短维修时间和在更换缺陷部件方面提供更大的灵活性。如果在诊断期间 HP（或 HP 服务提供商或服务合作伙伴）确定可以通过使用 CSR 部件完成维修，HP 将直接把该部件发送给您进行更换。有两类 CSR 部件：

- **强制性的** — 要求客户必须自行维修的部件。如果您请求 HP 更换这些部件，则必须为该服务支付差旅费和人工费用。
- **可选的** — 客户可以选择是否自行维修的部件。这些部件也是为客户自行维修设计的。不过，如果您要求 HP 为您更换这些部件，则根据为您的产品指定的保修服务类型，HP 可能收取或不再收取任何附加费用。

注：某些 HP 部件的设计并未考虑客户自行维修。为了满足客户保修的需要，HP 要求授权服务提供商更换相关部件。这些部件在部件图解目录中标记为“否”。

CSR 部件将在下一个工作日发运（取决于备货情况和允许的地理范围）。在允许的地理范围内，可在当天或四小时内发运，但要收取额外费用。如果需要帮助，您可以致电 HP 技术支持中心，将会有技术人员通过电话为您提供帮助。HP 会在随更换的 CSR 部件发运的材料中指明是否必须将有缺陷的部件返还给 HP。如果要求您将有缺陷的部件返还给 HP，那么您必须在规定期限内（通常是五 (5) 个工作日）将缺陷部件发给 HP。有缺陷的部件必须随所提供的发运材料中的相关文件一起返还。如果未能送还有缺陷的部件，HP 可能会要求您支付更换费用。客户自行维修时，HP 将承担所有相关运输和部件返回费用，并指定快递商/承运商。

有关 HP 客户自行维修计划的详细信息，请与您当地的服务提供商联系。有关北美地区的计划，请访问 HP 网站 (http://www.hp.com/go/selfrepair)。

仅部件保修服务

您的 HP 有限保修服务可能涉及仅部件保修服务。根据仅部件保修服务条款的规定，HP 将免费提供更换的部件。

仅部件保修服务要求进行 CSR 部件更换。如果您请求 HP 更换这些部件，则必须为该服务支付差旅费和人工费用。

客戶自行維修

HP 產品設計了許多「客戶自行維修」(CSR) 的零件以減少維修時間，並且使得更換瑕疵零件時能有更大的彈性。如果在診斷期間 HP（或 HP 服務供應商或維修夥伴）辨認出此項維修工作可以藉由使用 CSR 零件來完成，則 HP 將直接寄送該零件給您作更換。CSR 零件分為兩種類別：

- **強制的** — 客戶自行維修所使用的零件是強制性的。如果您要求 HP 更換這些零件，HP 將會向您收取此服務所需的外出費用與勞動成本。
- **選購的** — 客戶自行維修所使用的零件是選購的。這些零件也設計用於客戶自行維修之用。不過，如果您要求 HP 為您更換，則可能需要也可能不需要負擔額外的費用，端視針對此產品指定的保固服務類型而定。

備註：某些 HP 零件沒有消費者可自行維修的設計。為符合客戶保固，HP 需要授權的服務供應商更換零件。這些零件在圖示的零件目錄中，被標示為「否」。

基於材料取得及環境允許的情況下，CSR 零件將於下一個工作日以快遞寄送。在環境的允許下當天或四小時內送達，則可能需要額外的費用。若您需要協助，可致電「HP 技術支援中心」，會有一位技術人員透過電話來協助您。不論損壞的零件是否必須退回，HP 皆會在與 CSR 替換零件一起運送的材料中註明。若要將損壞的零件退回 HP，您必須在指定的一段時間內（通常為五 (5) 個工作天），將損壞的零件寄回 HP。損壞的零件必須與寄送資料中隨附的相關技術文件一併退還。如果無法退還損壞的零件，HP 可能要向您收取替換費用。針對客戶自行維修情形，HP 將負責所有運費及零件退還費用並指定使用何家快遞/貨運公司。

如需 HP 的「客戶自行維修」方案詳細資訊，請連絡您當地的服務供應商。至於北美方案，請參閱 HP 網站 (http://www.hp.com/go/selfrepair)。

僅限零件的保固服務

您的「HP 有限保固」可能包含僅限零件的保固服務。在僅限零件的保固服務情況下，HP 將免費提供替換零件。

針對僅限零件的保固服務，CSR 零件替換是強制性的。如果您要求 HP 更換這些零件，HP 將會向您收取此服務所需的外出費用與勞動成本。

고객 셀프 수리

HP 제품은 수리 시간을 최소화하고 결함이 있는 부품 교체 시 더욱 융통성을 발휘할 수 있도록 하기 위해 고객 셀프 수리(CSR) 부품을 다량 사용하여 설계되었습니다. 진단 기간 동안 HP(또는 HP 서비스 공급업체 또는 서비스 협력업체)에서 CSR 부품을 사용하여 수리가 가능하다고 판단되면 HP는 해당 부품을 바로 사용자에게 보내어 사용자가 교체할 수 있도록 합니다. CSR 부품에는 두 가지 종류가 있습니다.

- **고객 셀프 수리가 의무 사항인 필수 부품.** 사용자가 HP에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.
- **고객 셀프 수리가 선택 사항인 부품.** 이 부품들도 고객 셀프 수리가 가능하도록 설계되었습니다. 하지만 사용자가 HP에 이 부품의 교체를 요청할 경우 사용자가 구입한 제품에 해당하는 보증 서비스 유형에 따라 추가 비용 없이 교체가 가능할 수 있습니다.

참고: 일부 HP 부품은 고객 셀프 수리가 불가능하도록 설계되었습니다. HP는 만족스러운 고객 보증을 위해 공인 서비스 제공업체를 통해 부품을 교체하도록 하고 있습니다. 이러한 부품들은 Illustrated Parts Catalog에 "No"라고 표시되어 있습니다.

CSR 부품은 재고 상태와 지리적 조건이 허용하는 경우 다음 영업일 납품이 가능하도록 배송이 이루어집니다. 지리적 조건이 허용하는 경우 추가 비용이 청구되는 조건으로 당일 또는 4시간 배송이 가능할 수도 있습니다. 도움이 필요하시면 HP 기술 지원 센터로 전화하십시오. 전문 기술자가 전화로 도움을 줄 것입니다. HP는 결함이 발생한 부품을 HP로 반환해야 하는지 여부를 CSR 교체 부품과 함께 배송된 자료에 지정합니다. 결함이 발생한 부품을 HP로 반환해야 하는 경우에는 지정된 기간 내(통상 영업일 기준 5일)에 HP로 반환해야 합니다. 이 때 결함이 발생한 부품은 제공된 포장 재료에 넣어 관련 설명서와 함께 반환해야 합니다. 결함이 발생한 부품을 반환하지 않는 경우 HP가 교체 부품에 대해 비용을 청구할 수 있습니다. 고객 셀프 수리의 경우, HP는 모든 운송 및 부품 반환 비용을 부담하며 이용할 운송업체 및 택배 서비스를 결정합니다.

HP 고객 셀프 수리 프로그램에 대한 자세한 내용은 가까운 서비스 제공업체에 문의하십시오. 북미 지역의 프로그램에 대해서는 HP 웹 사이트(http://www.hp.com/go/selfrepair)를 참조하십시오.

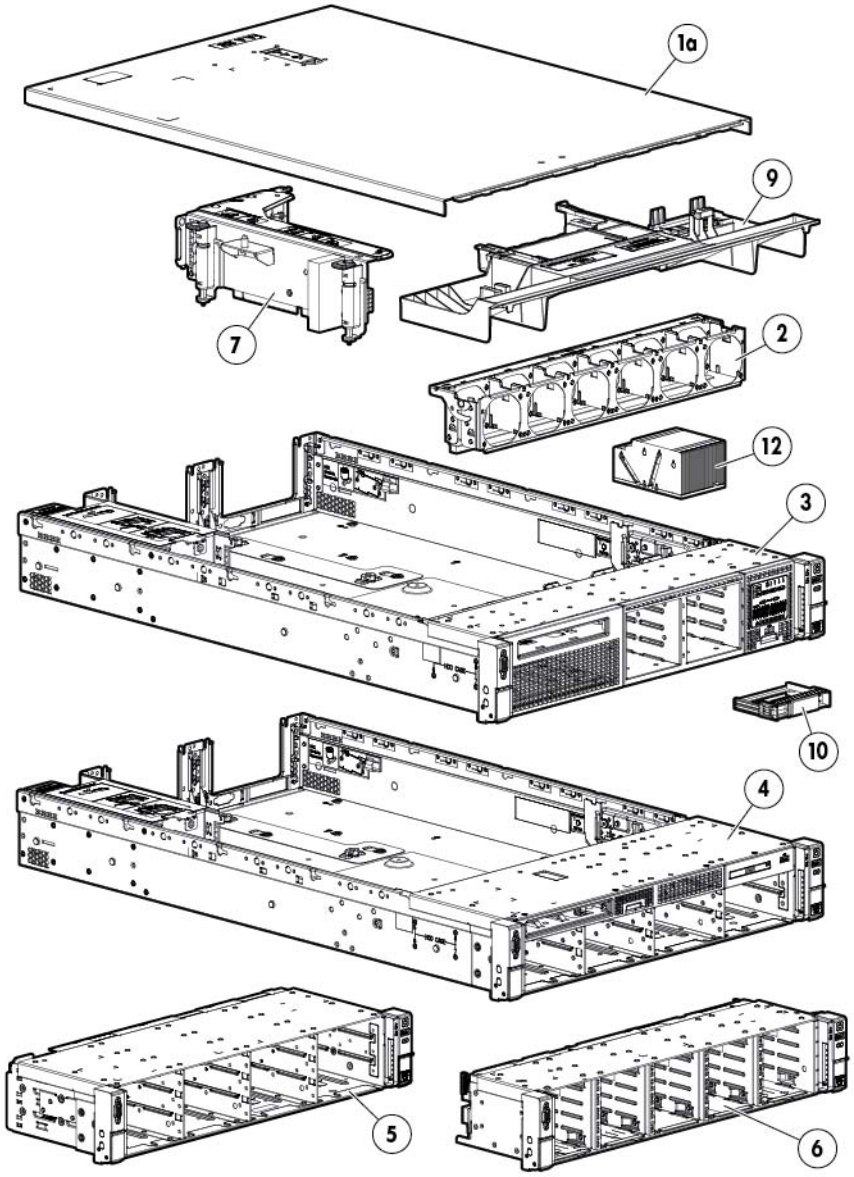
부품 제공 보증 서비스

HP 제한 보증에는 부품 제공 보증 서비스가 포함될 수 있습니다. 이러한 경우 HP는 부품 제공 보증 서비스의 조건에 따라 교체 부품만을 무료로 제공합니다.

부품 제공 보증 서비스 제공 시 CSR 부품 교체는 의무 사항입니다. 사용자가 HP에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.

Illustrated parts catalog

Mechanical components



Item	Description	Spare part number	Customer self repair (on page 6)
1	Access panel	—	—
	a) Access panel, 8SFF, 8LFF	691272-001	Mandatory[1]
	b) Access panel, 25SFF, 12LFF*	691273-001	Mandatory[1]

Item	Description	Spare part number	Customer self repair (on page 6)
2	Fan cage	662518-001	Mandatory[1]
3	SFF hard drive backplane, 8 bay cage, with cables, left and right ears	696955-001	Optional[2]
4	LFF hard drive backplane, 8-bay cage, with cables, left and right ears	696956-001	Optional[2]
5	LFF hard drive backplane, 12-bay cage, with cables, left and right ears	696957-001	Optional[2]
6	SFF hard drive backplane, 25-bay cage, with cables, left and right ears	691265-001	Optional[2]
7	Primary PCIe riser cage	662526-001	Mandatory[1]
8	Secondary PCIe riser cage, with PCA*	691268-001	
9	Air baffle kit	691270-001	Mandatory[1]
10	Hard drive blank	—	—
	a) Hard drive blank, SFF	667276-001	Mandatory[1]
	b) Hard drive blank, LFF*	667279-001	Mandatory[1]
11	Hardware blank kit	662519-001	Mandatory[1]
	a) Optical device blank*	—	—
	b) Fan blank*	—	—
	c) FlexibleLOM blank*	—	—
	d) PCI riser cage blank*	—	—
	e) Expansion slot blank*	—	—
12	Power supply blank*	699833-001	Mandatory[1]
13	Heatsink	679333-001	Optional[2]
14	Heatsink HE*	691267-001	Optional[2]
15	Heatsink blank*	691275-001	Mandatory[1]
16	Processor cage*	691274-001	Optional[2]
17	2U rack bezel*	662529-001	Mandatory[1]
18	Miscellaneous hardware kit*	662523-001	Mandatory[1]
	a) Fan bracket, left	—	—
	b) Fan bracket, right	—	—
	c) Trough cable routing guide	—	—
	d) Clip cable retainer	—	—
	e) DIMM cable guide	—	—
19	Miscellaneous hardware kit S2*	699832-001	Mandatory[1]
	a) Plastic battery holder	—	—
	b) PCIe riser cage divider	—	—
	Rack mounting hardware	—	—
20	Ball bearing rail kit, SFF*	662535-001	Mandatory[1]
21	Ball bearing rail kit, LFF*	692480-001	Mandatory[1]
22	Friction rail kit*	662536-001	Mandatory[1]
23	Cable management arm (not supported with	675606-001	Mandatory[1]

Item	Description	Spare part number	Customer self repair (on page 6)
	the friction rail kit)*		

* Not shown
[1]Mandatory—Parts for which customer self repair is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.
[2]Optional—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that HP replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.
[3]No—Some HP parts are not designed for customer self repair. In order to satisfy the customer warranty, HP requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

[1]Mandatory: Obligatoire—Pièces pour lesquelles la réparation par le client est obligatoire. Si vous demandez à HP de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.
[2]Optional: Facultatif—Pièces pour lesquelles la réparation par le client est facultative. Ces pièces sont également conçues pour permettre au client d'effectuer lui-même la réparation. Toutefois, si vous demandez à HP de remplacer ces pièces, l'intervention peut ou non vous être facturée, selon le type de garantie applicable à votre produit.
[3]No: Non—Certaines pièces HP ne sont pas conçues pour permettre au client d'effectuer lui-même la réparation. Pour que la garantie puisse s'appliquer, HP exige que le remplacement de la pièce soit effectué par un Mainteneur Agréé. Ces pièces sont identifiées par la mention “Non” dans le Catalogue illustré.

[1]Mandatory: Obbligatorie—Parti che devono essere necessariamente riparate dal cliente. Se il cliente ne affida la riparazione ad HP, deve sostenere le spese di spedizione e di manodopera per il servizio.
[2]Optional: Opzionali—Parti la cui riparazione da parte del cliente è facoltativa. Si tratta comunque di componenti progettati per questo scopo. Se tuttavia il cliente ne richiede la sostituzione ad HP, potrebbe dover sostenere spese addizionali a seconda del tipo di garanzia previsto per il prodotto.
[3]No: Non CSR—Alcuni componenti HP non sono progettati per la riparazione da parte del cliente. Per rispettare la garanzia, HP richiede che queste parti siano sostituite da un centro di assistenza autorizzato. Tali parti sono identificate da un “No” nel Catalogo illustrato dei componenti.

[1]Mandatory: Zwingend—Teile, die im Rahmen des Customer Self Repair Programms ersetzt werden müssen. Wenn Sie diese Teile von HP ersetzen lassen, werden Ihnen die Versand- und Arbeitskosten für diesen Service berechnet.
[2]Optional: Optional—Teile, für die das Customer Self Repair-Verfahren optional ist. Diese Teile sind auch für Customer Self Repair ausgelegt. Wenn Sie jedoch den Austausch dieser Teile von HP vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.
[3]No: Kein—Einige Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem HP Servicepartner ersetzt werden. Im illustrierten Teilekatalog sind diese Teile mit „No“ bzw. „Nein“ gekennzeichnet.

[1]Mandatory: Obligatorio—componentes para los que la reparación por parte del usuario es obligatoria. Si solicita a HP que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.
[2]Optional: Opcional— componentes para los que la reparación por parte del usuario es opcional. Estos componentes también están diseñados para que puedan ser reparados por el usuario. Sin embargo, si precisa que HP realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.
[3]No: No—Algunos componentes no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, HP pone como condición que un proveedor de servicios autorizado realice la sustitución de estos componentes. Dichos componentes se identifican con la palabra “No” en el catálogo ilustrado de componentes.

[1]Mandatory: Verplicht—Onderdelen waarvoor Customer Self Repair verplicht is. Als u HP verzoekt deze onderdelen te vervangen, komen de reiskosten en het arbeidsloon voor uw rekening.
[2]Optional: Optioneel—Onderdelen waarvoor reparatie door de klant optioneel is. Ook deze onderdelen zijn ontworpen voor reparatie door de klant. Als u echter HP verzoekt deze onderdelen voor u te vervangen, kunnen daarvoor extra kosten in rekening worden gebracht, afhankelijk van het type garantieservice voor het product.

[3]No: Nee—Sommige HP onderdelen zijn niet ontwikkeld voor reparatie door de klant. In verband met de garantievoorwaarden moet het onderdeel door een geautoriseerde Service Partner worden vervangen. Deze onderdelen worden in de geïllustreerde onderdelencatalogus aangemerkt met "Nee".

[1]Mandatory: Obrigatória—Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a HP substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.
[2]Optional: Opcional—Peças cujo reparo feito pelo cliente é opcional. Essas peças também são projetadas para o reparo feito pelo cliente. No entanto, se desejar que a HP as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.
[3]No: Nenhuma—Algumas peças da HP não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a HP exige que um técnico autorizado substitua a peça. Essas peças estão identificadas com a marca “No” (Não), no catálogo de peças ilustrado.

[1]Mandatory：必須 - 顧客自己修理が必須の部品。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費がお客様に請求されます。

[2]Optional：任意 - 顧客自己修理が任意である部品。この部品も顧客自己修理用です。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、お買い上げの製品に適用される保証サービス内容の範囲内においては、費用を負担していただくことなく保証サービスを受けることができます。

[3]No：除外 - HP製品の一部の部品は、顧客自己修理用ではありません。製品の保証を継続するためには、HPまたはHP正規保守代理店による交換作業が必須となります。部品カタログには、当該部品が顧客自己修理除外品である旨が記載されています。

[1]Mandatory: 强制性的 — 要求客户必须自行维修的部件。如果您请求 HP 更换这些部件，则必须为该服务支付差旅费和人工费用。

[2]Optional: 可选的 — 客户可以选择是否自行维修的部件。这些部件也是为客户自行维修设计的。不过，如果您要求 HP 为您更换这些部件，则根据为您的产品指定的保修服务类型，HP 可能收取或不再收取任何附加费用。

[3]No: 否 — 某些 HP 部件的设计并未考虑客户自行维修。为了满足客户保修的需要，HP 要求授权服务提供商更换相关部件。这些部件在部件图解目录中标记为“否”。

[1]Mandatory: 強制的 — 客戶自行維修所使用的零件是強制性的。如果您要求 HP 更換這些零件，HP 將會向您收取此服務所需的外出費用與勞動成本。

[2]Optional: 選購的 — 客戶自行維修所使用的零件是選購的。這些零件也設計用於客戶自行維修之用。不過，如果您要求 HP 為您更換，則可能需要也可能不需要負擔額外的費用，端視針對此產品指定的保固服務類型而定。

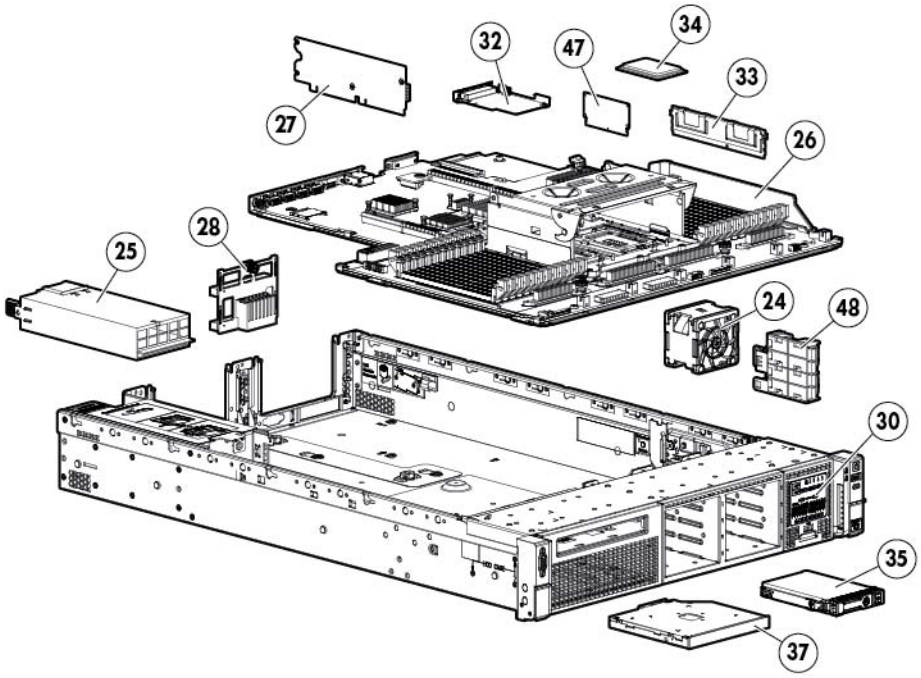
[3]No: 否 — 某些 HP 零件沒有消費者可自行維修的設計。為符合客戶保固，HP 需要授權的服務供應商更換零件。這些零件在圖示的零件目錄中，被標示為「否」。

[1] Mandatory: 필수 — 고객 셀프 수리가 의무 사항인 필수 부품. 사용자가 HP에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.

[2] Optional: 옵션 — 고객 셀프 수리가 선택 사항인 부품. 이 부품들도 고객 셀프 수리가 가능하도록 설계되었습니다. 하지만 사용자가 HP에 이 부품의 교체를 요청할 경우 사용자가 구입한 제품에 해당하는 보증 서비스 유형에 따라 추가 비용 없이 교체가 가능할 수 있습니다.

[3] No: No — 고객 셀프 수리가 불가능하도록 설계된 HP 부품. 이 부품들은 고객 셀프 수리가 불가능하도록 설계되었습니다. HP는 고객 보증을 만족시키기 위해 공인 서비스 제공업체를 통해 부품을 교체하도록 하고 있습니다.

System components



Item	Description	Spare part number	Customer self repair (on page 6)
	System components	—	—
24	Hot-plug fan	662520-001	Mandatory[1]
25	Power supplies, hot-plug	—	—
	a) 460 W, 92%	511777-001	Mandatory[1]
	b) 460 W, Platinum Plus, 94%*	660184-001	Mandatory[1]
	c) 750 W, 92%*	511778-001	Mandatory[1]
	d) 750 W, Platinum Plus, 94%*	660183-001	Mandatory[1]
	e) 750 W 48V DC, 92%*	675038-001	Mandatory[1]
	f) 1200 W, Platinum Plus, 90%*	660185-001	Mandatory[1]
	Boards	—	—
26	System board assembly	691271-001	Optional[2]
27	PCIe riser board, standard 3-slot	662524-001	Optional[2]
28	Power supply backplane	662528-001	Mandatory[1]
29	Systems Insight Display subassembly, LFF, with cables*	691263-001	Optional[2]
30	Systems Insight Display subassembly, SFF, with cables	691264-001	Optional[2]
31	HP Trusted Platform Module*	505836-001	No[3]
32	FlexibleLOM	—	—

Item	Description	Spare part number	Customer self repair (on page 6)
	a) HP 1GbE 4-port, 331FLR Adapter FIO Kit	634025-001	Mandatory[1]
	b) HP 10GbE 2-port, 530FLR Adapter FIO Kit*	649869-001	Mandatory[1]
	c) HP Ff 10Gb 2-port, 554FLR-SFP+ Adapter FIO Kit*	634026-001	Mandatory[1]
	d) HP InfiniBand FDR/EN 10/40Gb 2-port, 544FLR-QSFP Adapter*	656090-001	Mandatory[1]
	e) HP InfiniBand QDR/EN 10Gb 2-port, 544FLR-QSFP Adapter*	656091-001	Mandatory[1]
	Memory	—	—
33	DIMMs	—	—
	a) 4-GB, 1Rx4 PC3U-10600R-9	687457-001	Mandatory[1]
	b) 4-GB, 1Rx4 PC3L-10600R-9	687458-001	Mandatory[1]
	c) 4-GB, 1Rx4 PC3-12800R-11	687459-001	Mandatory[1]
	d) 8-GB, 2Rx4 PC3U-10600R-9	687460-001	Mandatory[1]
	e) 8-GB, 2Rx4 PC3L-16000R-9	687461-001	Mandatory[1]
	f) 8-GB, 1Rx4 PC3-12800R-11	687462-001	Mandatory[1]
	g) 16-GB, 2Rx4 PC3U-10600R-9	687463-001	Mandatory[1]
	h) 16-GB, 2Rx4 PC3L-10600R-9	687464-001	Mandatory[1]
	i) 16-GB, 2Rx4 PC3-12800R-11	687465-001	Mandatory[1]
	j) 32-GB, 4Rx4 PC3L-10600L-9	687466-001	Mandatory[1]
34	**Processors** **	—	—
	a) 1.60-GHz AMD Opteron processor 6262HE, 85W	662841-001	Optional[2]
	b) 2.10-GHz AMD Opteron processor 6272, 115W*	662836-001	Optional[2]
	c) 2.20-GHz AMD Opteron processor 6274, 115W*	662835-001	Optional[2]
	d) 2.30-GHz AMD Opteron processor 6276, 115W*	662834-001	Optional[2]
	e) 2.40-GHz AMD Opteron processor 6234, 115W*	662838-001	Optional[2]
	f) 2.40-GHz AMD Opteron processor 6278, 115W*	689494-001	Optional[2]
	g) 2.60-GHz AMD Opteron processor 6212, 115W*	662840-001	Optional[2]
	h) 2.60-GHz AMD Opteron processor 6238, 115W*	662837-001	Optional[2]
	i) 2.70-GHz AMD Opteron processor 6284SE, 140W*	696244-001	Optional[2]
	j) 3.00-GHz AMD Opteron processor 6220, 115W*	662839-001	Optional[2]
	k) 3.30-GHz AMD Opteron 6204, 115W*	672234-001	Optional[2]
	Drives	—	—
35	Hot-plug SATA	—	—

Item	Description	Spare part number	Customer self repair (on page 6)
	a) 500-GB, 7,200-rpm, LFF, 6G	658103-001	Mandatory[1]
	b) 1-TB, 7,200-rpm, LFF, 6G*	657739-001	Mandatory[1]
	c) 2-TB, 7,200-rpm, LFF, 6G*	658102-001	Mandatory[1]
	d) 3-TB, 7,200-rpm, LFF, 6G*	628182-001	Mandatory[1]
	e) 500-GB, 7,200-rpm, SFF, 6G	656107-001	Mandatory[1]
	f) 1-TB, 7,200-rpm, SFF, 6G	656108-001	Mandatory[1]
	Hot-plug SAS*	—	—
	a) 2-TB, 7,200-rpm, LFF, 6G, dual port	653948-001	Mandatory[1]
	b) 3-TB, 7,200-rpm, LFF, 6G, dual port	653959-001	Mandatory[1]
	c) 300-GB, 10,000-rpm, SFF, 6G, dual port	653955-001	Mandatory[1]
	d) 450-GB, 10,000-rpm, SFF, 6G, dual port	653956-001	Mandatory[1]
	e) 600-GB, 10,000-rpm, SFF, 6G, dual port	653957-001	Mandatory[1]
	f) 900-GB, 10,000-rpm, SFF, 6G, dual port	653971-001	Mandatory[1]
	g) 72-GB, 15,000-rpm, SFF, 6G, dual port	653949-001	Mandatory[1]
	h) 146-GB, 15,000-rpm, SFF, 6G, dual port	653950-001	Mandatory[1]
	i) 300-GB, 15,000-rpm, SFF, 6G, dual port	653960-001	Mandatory[1]
	j) 450-GB, 15,000-rpm, LFF, 6G, dual port	653951-001	Mandatory[1]
	k) 600-GB, 15,000-rpm, LFF, 6G, dual port	653952-001	Mandatory[1]
	l) 500-GB, 7,200-rpm, SFF, 6G, dual port	653953-001	Mandatory[1]
	m) 1-TB, 7,200-rpm, SFF, 6G, dual port	653954-001	Mandatory[1]
	n) 1-TB, 7,200-rpm, LFF, 6G, dual port	653947-001	Mandatory[1]
	Hot-plug solid state SATA*	—	—
	a) 100-GB, SFF, MLC, 3G	653965-001	Mandatory[1]
	b) 200-GB, SFF, MLC, 3G	653966-001	Mandatory[1]
	c) 400-GB, SFF, MLC, 3G	653967-001	Mandatory[1]
	d) 100-GB, LFF, MLC, 3G	653968-001	Mandatory[1]
	e) 200-GB, LFF, MLC, 3G	653969-001	Mandatory[1]
	f) 400-GB, LFF, MLC, 3G	653970-001	Mandatory[1]
	Hot-plug solid state SAS*	—	—
	a) 200-GB, SFF, SLC	653961-001	Mandatory[1]
	b) 400-GB, SFF, SLC	653962-001	Mandatory[1]
	c) 400-GB, SFF, MLC	653963-001	Mandatory[1]
	d) 800-GB, SFF, MLC	653964-001	Mandatory[1]
	Optical drives	—	—
36	Optical drive module*	675601-001	Mandatory[1]

Item	Description	Spare part number	Customer self repair (on page 6)
37	Slimline 8x/24x DVD-ROM drive	652294-001	Mandatory[1]
38	Slimline 8x DVD+R/RW drive*	652295-001	Mandatory[1]
	Cables	—	—
39	LFF ribbon Mini-SAS storage cable*	675609-001	Mandatory[1]
40	SFF ribbon Mini-SAS storage cable*	675610-001	Mandatory[1]
41	SFF Mini-SAS hard drive backplane to storage card*	675611-001	Mandatory[1]
42	LFF power cable*	675612-001	Mandatory[1]
43	SFF power cable*	675613-001	Mandatory[1]
44	Slim SATA cable*	675614-001	Mandatory[1]
45	Mini-SAS STR to STR, 93.98 cm (37 in)	675615-001	Mandatory[1]
	12 LFF power cable	675612-001	Mandatory[1]
	25 SFF power cable	675613-001	Mandatory[1]
	12 LFF Mini-SAS SR cable	675609-001	Mandatory[1]
	25 SFF Mini-SAS SR cable	675610-001	Mandatory[1]
	Battery	—	—
46	System battery, 3.3-V, lithium*	153099-001	Mandatory[1]
	Controller option	—	—
47	FBWC cache module	—	—
	a) 512-MB cache	633540-001	Optional[2]
	b) 1-GB cache*	633542-001	Optional[2]
	c) 2-GB cache*	633543-001	Optional[2]
48	FBWC capacitor pack with cable	660093-001	Optional[2]
49	Controllers*	—	—
	a) HP Smart Array P222	633537-001	Optional[2]
	b) HP Smart Array P421	633538-001	Optional[2]
	c) HP Smart Array P420	633539-001	Optional[2]

*Not shown

**All processors in this HP ProLiant server must have the same cache size, speed, number of cores, and rated maximum power consumption.

[1]Mandatory—Parts for which customer self repair is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.

[2]Optional—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that HP replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.

[3]No—Some HP parts are not designed for customer self repair. In order to satisfy the customer warranty, HP requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

[1]Mandatory: Obligatoire—Pièces pour lesquelles la réparation par le client est obligatoire. Si vous demandez à HP de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.

[2]Optional: Facultatif—Pièces pour lesquelles la réparation par le client est facultative. Ces pièces sont également conçues pour permettre au client d'effectuer lui-même la réparation. Toutefois, si vous demandez à HP de remplacer ces pièces, l'intervention peut ou non vous être facturée, selon le type de garantie applicable à votre produit.

[3]No: Non—Certaines pièces HP ne sont pas conçues pour permettre au client d'effectuer lui-même la réparation. Pour que la garantie puisse s'appliquer, HP exige que le remplacement de la pièce soit effectué par un Mainteneur Agréé. Ces pièces sont identifiées par la mention “Non” dans le Catalogue illustré.

[1]Mandatory: Obbligatorie—Parti che devono essere necessariamente riparate dal cliente. Se il cliente ne affida la riparazione ad HP, deve sostenere le spese di spedizione e di manodopera per il servizio.
[2]Optional: Opzionali—Parti la cui riparazione da parte del cliente è facoltativa. Si tratta comunque di componenti progettati per questo scopo. Se tuttavia il cliente ne richiede la sostituzione ad HP, potrebbe dover sostenere spese addizionali a seconda del tipo di garanzia previsto per il prodotto.
[3]No: Non CSR—Alcuni componenti HP non sono progettati per la riparazione da parte del cliente. Per rispettare la garanzia, HP richiede che queste parti siano sostituite da un centro di assistenza autorizzato. Tali parti sono identificate da un “No” nel Catalogo illustrato dei componenti.

[1]Mandatory: Zwingend—Teile, die im Rahmen des Customer Self Repair Programms ersetzt werden müssen. Wenn Sie diese Teile von HP ersetzen lassen, werden Ihnen die Versand- und Arbeitskosten für diesen Service berechnet.
[2]Optional: Optional—Teile, für die das Customer Self Repair-Verfahren optional ist. Diese Teile sind auch für Customer Self Repair ausgelegt. Wenn Sie jedoch den Austausch dieser Teile von HP vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.
[3]No: Kein—Einige Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem HP Servicepartner ersetzt werden. Im illustrierten Teilekatalog sind diese Teile mit „No“ bzw. „Nein“ gekennzeichnet.

[1]Mandatory: Obligatorio—componentes para los que la reparación por parte del usuario es obligatoria. Si solicita a HP que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.
[2]Optional: Opcional— componentes para los que la reparación por parte del usuario es opcional. Estos componentes también están diseñados para que puedan ser reparados por el usuario. Sin embargo, si precisa que HP realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.
[3]No: No—Algunos componentes no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, HP pone como condición que un proveedor de servicios autorizado realice la sustitución de estos componentes. Dichos componentes se identifican con la palabra “No” en el catálogo ilustrado de componentes.

[1]Mandatory: Verplicht—Onderdelen waarvoor Customer Self Repair verplicht is. Als u HP verzoekt deze onderdelen te vervangen, komen de reiskosten en het arbeidsloon voor uw rekening.
[2]Optional: Optioneel—Onderdelen waarvoor reparatie door de klant optioneel is. Ook deze onderdelen zijn ontworpen voor reparatie door de klant. Als u echter HP verzoekt deze onderdelen voor u te vervangen, kunnen daarvoor extra kosten in rekening worden gebracht, afhankelijk van het type garantieservice voor het product.
[3]No: Nee—Sommige HP onderdelen zijn niet ontwikkeld voor reparatie door de klant. In verband met de garantievoorwaarden moet het onderdeel door een geautoriseerde Service Partner worden vervangen. Deze onderdelen worden in de geïllustreerde onderdelencatalogus aangemerkt met "Nee".

[1]Mandatory: Obrigatória—Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a HP substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.
[2]Optional: Opcional—Peças cujo reparo feito pelo cliente é opcional. Essas peças também são projetadas para o reparo feito pelo cliente. No entanto, se desejar que a HP as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.
[3]No: Nenhuma—Algumas peças da HP não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a HP exige que um técnico autorizado substitua a peça. Essas peças estão identificadas com a marca “No” (Não), no catálogo de peças ilustrado.

[1]Mandatory：必須 - 顧客自己修理が必須の部品。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費がお客様に請求されます。

[2]Optional：任意 - 顧客自己修理が任意である部品。この部品も顧客自己修理用です。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、お買い上げの製品に適用される保証サービス内容の範囲内においては、費用を負担していただくことなく保証サービスを受けることができます。

[3]No：除外 - HP製品の一部の部品は、顧客自己修理用ではありません。製品の保証を継続するためには、HPまたはHP正規保守代理店による交換作業が必須となります。部品カタログには、当該部品が顧客自己修理除外品である旨が記載されています。

[1]Mandatory: 强制性的 — 要求客户必须自行维修的部件。如果您请求 HP 更换这些部件，则必须为该服务支付差旅费和人工费用。

[2]Optional: 可选的 — 客户可以选择是否自行维修的部件。这些部件也是为客户自行维修设计的。不过，如果您要求 HP 为您更换这些部件，则根据为您的产品指定的保修服务类型，HP 可能收取或不再收取任何附加费用。

[3]No: 否 — 某些 HP 部件的设计并未考虑客户自行维修。为了满足客户保修的需要，HP 要求授权服务提供商更换相关部件。这些部件在部件图解目录中标记为“否”。

[1]Mandatory: 強制的 — 客戶自行維修所使用的零件是強制性的。如果您要求 HP 更換這些零件，HP 將會向您收取此服務所需的外出費用與勞動成本。

[2]Optional: 選購的 — 客戶自行維修所使用的零件是選購的。這些零件也設計用於客戶自行維修之用。不過，如果您要求 HP 為您更換，則可能需要也可能不需要負擔額外的費用，端視針對此產品指定的保固服務類型而定。

[3]No: 否 — 某些 HP 零件沒有消費者可自行維修的設計。為符合客戶保固，HP 需要授權的服務供應商更換零件。這些零件在圖示的零件目錄中，被標示為「否」。

[1] Mandatory: 필수 — 고객 셀프 수리가 의무 사항인 필수 부품. 사용자가 HP에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.

[2] Optional: 옵션 — 고객 셀프 수리가 선택 사항인 부품. 이 부품들도 고객 셀프 수리가 가능하도록 설계되었습니다. 하지만 사용자가 HP에 이 부품의 교체를 요청할 경우 사용자가 구입한 제품에 해당하는 보증 서비스 유형에 따라 추가 비용 없이 교체가 가능할 수 있습니다.

[3] No: No — 고객 셀프 수리가 불가능하도록 설계된 HP 부품. 이 부품들은 고객 셀프 수리가 불가능하도록 설계되었습니다. HP는 고객 보증을 만족시키기 위해 공인 서비스 제공업체를 통해 부품을 교체하도록 하고 있습니다.

Removal and replacement procedures

Required tools

You need the following items for some procedures:

- T-10/T-15 Torx screwdriver (included with the server)
- HP Insight Diagnostics software ("HP Insight Diagnostics" on page 79)

Preparation procedures

To access some components and perform certain service procedures, you must perform one or more of the following procedures:

- Extend the server from the rack (on page 28).

  If you are performing service procedures in an HP, Compaq branded, telco, or third-party rack cabinet, you can use the locking feature of the rack rails to support the server and gain access to internal components.

  For more information about telco rack solutions, refer to the RackSolutions.com website (http://www.racksolutions.com/hp).
- Power down the server (on page 27).

  If you must remove a server from a rack or a non-hot-plug component from a server, power down the server.
- Remove the server from the rack (on page 29).

  If the rack environment, cabling configuration, or the server location in the rack creates awkward conditions, remove the server from the rack.
- Access the product rear panel (on page 30).
- Access the Systems Insight Display (on page 29).
- Release the full-length expansion board retainer (on page 31).

Power down the server

Before powering down the server for any upgrade or maintenance procedures, perform a backup of critical server data and programs.

IMPORTANT: When the server is in standby mode, auxiliary power is still being provided to the system.

To power down the server, use one of the following methods:

- Press and release the Power On/Standby button.

  This method initiates a controlled shutdown of applications and the OS before the server enters standby mode.

- Press and hold the Power On/Standby button for more than 4 seconds to force the server to enter standby mode.

  This method forces the server to enter standby mode without properly exiting applications and the OS. If an application stops responding, you can use this method to force a shutdown.

- Use a virtual power button selection through HP iLO.

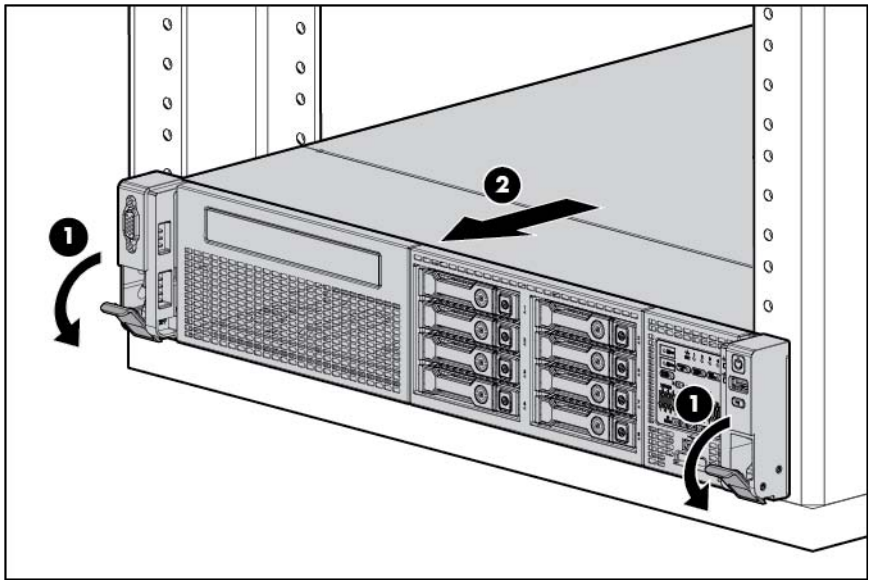
  This method initiates a controlled remote shutdown of applications and the OS before the server enters standby mode.

Before proceeding, verify the server is in standby mode by observing that the system power LED is amber.

Extend the server from the rack

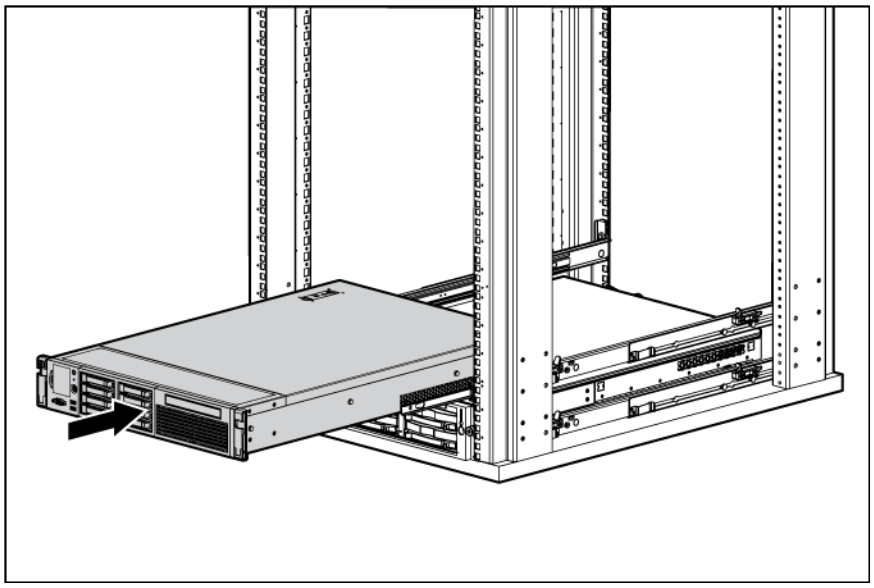
1. Pull down the quick release levers on each side of the server.
2. Extend the server from the rack.

WARNING: To reduce the risk of personal injury or equipment damage, be sure that the rack is adequately stabilized before extending a component from the rack.



3. After performing the installation or maintenance procedure, slide the server back into the rack, and then press the server firmly into the rack to secure it in place.

WARNING: To reduce the risk of personal injury, be careful when pressing the server rail-release latches and sliding the server into the rack. The sliding rails could pinch your fingers.



Remove the server from the rack

To remove the server from an HP, Compaq branded, telco, or third-party rack:

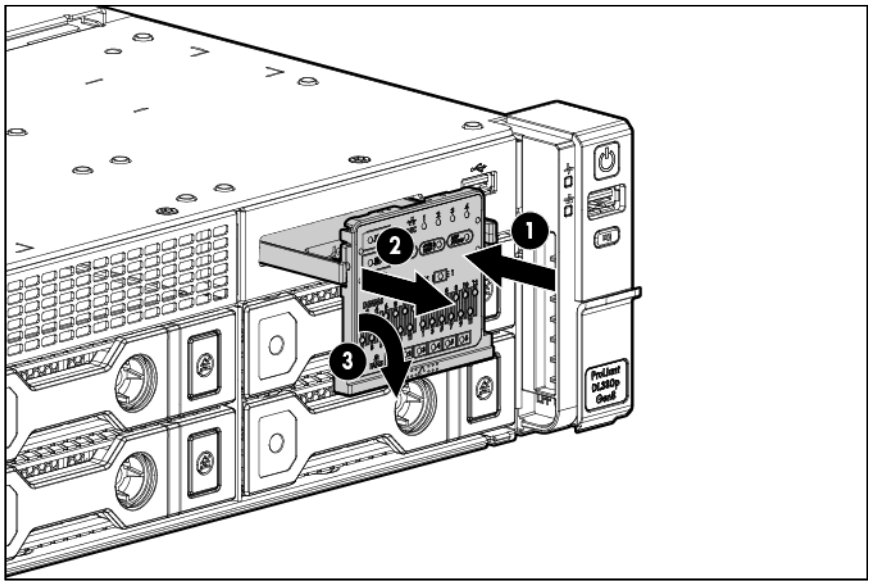
1. Power down the server (on page 27).
2. Extend the server from the rack (on page 28).
3. Disconnect the cabling and remove the server from the rack. For more information, refer to the documentation that ships with the rack mounting option.
4. Place the server on a sturdy, level surface.

Access the Systems Insight Display

To access the HP Systems Insight Display in a server with an 8-drive LFF configuration:

1. Press and release the panel.

2. After the display fully ejects, rotate the display downward to view the LEDs.



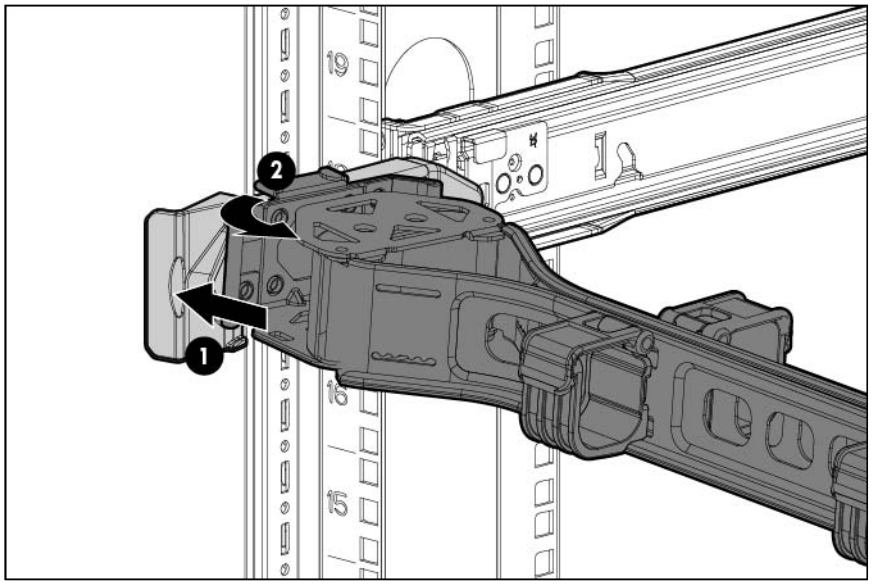
Access the product rear panel

Opening the cable management arm

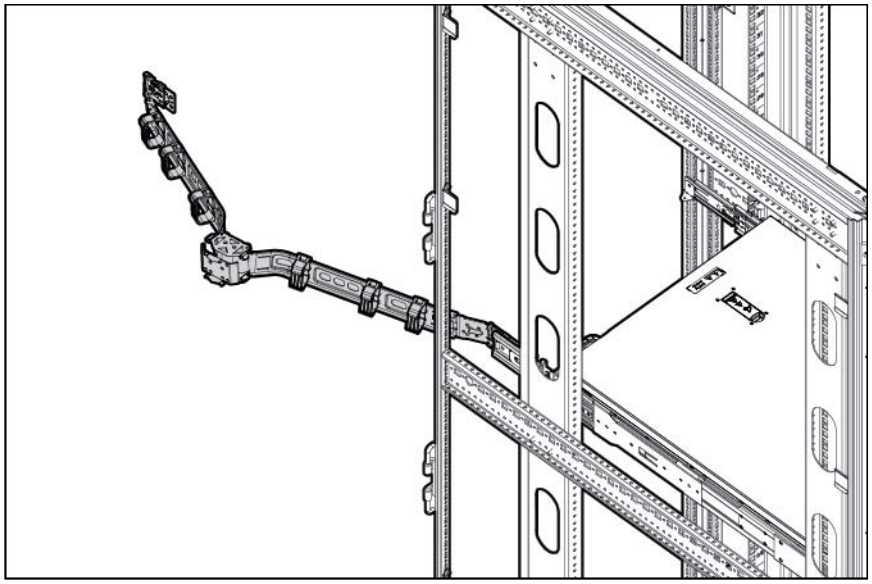
IMPORTANT: The cable management arm is not supported with the friction rail kit.

To access the server rear panel:

1. Release the cable management arm.



2. Open the cable management arm. Note that the cable management arm can be right-mounted or left-mounted.

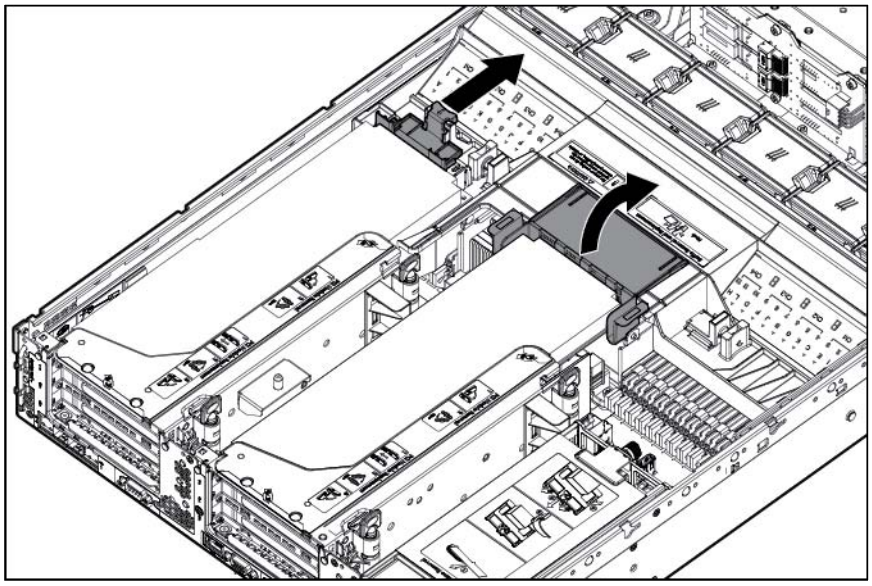


Release the full-length expansion board retainer

The air baffle has full-length expansion board retainers for both the primary and secondary PCIe riser cages. To release the components:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
4. Remove the access panel ("Access panel" on page 33).

5. Release the full-length expansion board retainers.



To replace the component, reverse the removal procedure.

Safety considerations

Before performing service procedures, review all the safety information.

Preventing electrostatic discharge

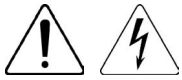
To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Symbols on equipment

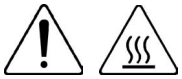
The following symbols may be placed on equipment to indicate the presence of potentially hazardous conditions.



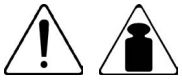
This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.
WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.

This symbol indicates the presence of electric shock hazards. The area contains no user or field serviceable parts. Do not open for any reason.
WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.

This symbol on an RJ-45 receptacle indicates a network interface connection.
WARNING: To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.



This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.
WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.



22.63-30.19 kg
49.9-65.5 lb

This symbol indicates that the component exceeds the recommended weight for one individual to handle safely.
WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

These symbols, on power supplies or systems, indicate that the equipment is supplied by multiple sources of power.
WARNING: To reduce the risk of injury from electric shock, remove all power cords to completely disconnect power from the system.

Server warnings and cautions

Before installing a server, be sure that you understand the following warnings and cautions.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Unplug the power cord from the power supply to disconnect power to the equipment.
- Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

CAUTION: Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.

Access panel

WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

CAUTION: For proper cooling do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.

To remove the component:

1. Power down the server if performing a non-hot-plug installation or maintenance procedure ("Power down the server" on page 27).
2. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
3. Use the T-15 Torx screwdriver attached to the rear of the server to loosen the security screw on the hood latch.
4. Lift up on the hood latch handle, and then remove the access panel.

To replace the component, reverse the removal procedure.

Air baffle

CAUTION: For proper cooling do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.

To remove the component:

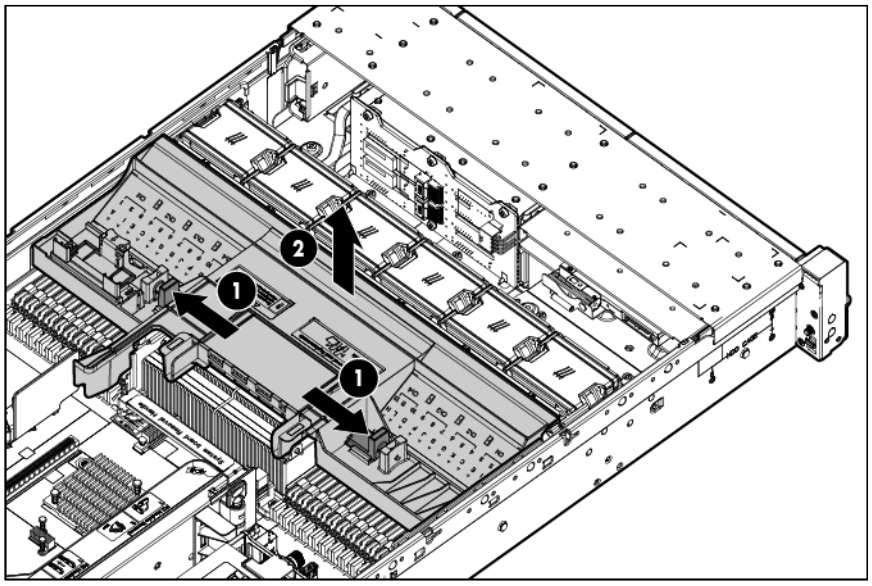
1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend or remove the server from the rack ("Remove the server from the rack" on page 29, "Extend the server from the rack" on page 28).
4. Remove the access panel ("Access panel" on page 33).

CAUTION: Do not detach the cable that connects the battery pack to the cache module. Detaching the cable causes any unsaved data in the cache module to be lost.

IMPORTANT: It is necessary to remove the PCIe riser cage only if there is a full-length expansion board installed.

5. If a full-length expansion board is installed in the primary PCIe riser cage, release the expansion board retainer and remove the primary PCIe riser cage (on page 36).
6. If a full-length expansion board is installed in the secondary PCIe riser cage, release the expansion board retainer and remove the secondary PCIe riser cage (on page 37).

7. Remove the air baffle.

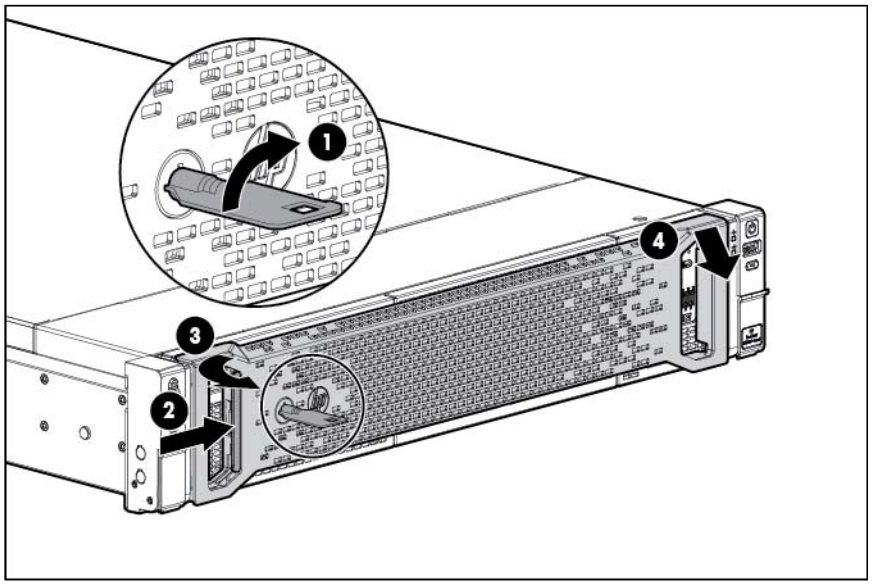


To install the component, reverse the removal procedure.

2U rack bezel

To remove the component:

Unlock the 2U rack bezel, press the latch on the 2U rack bezel, and then remove the 2U rack bezel.



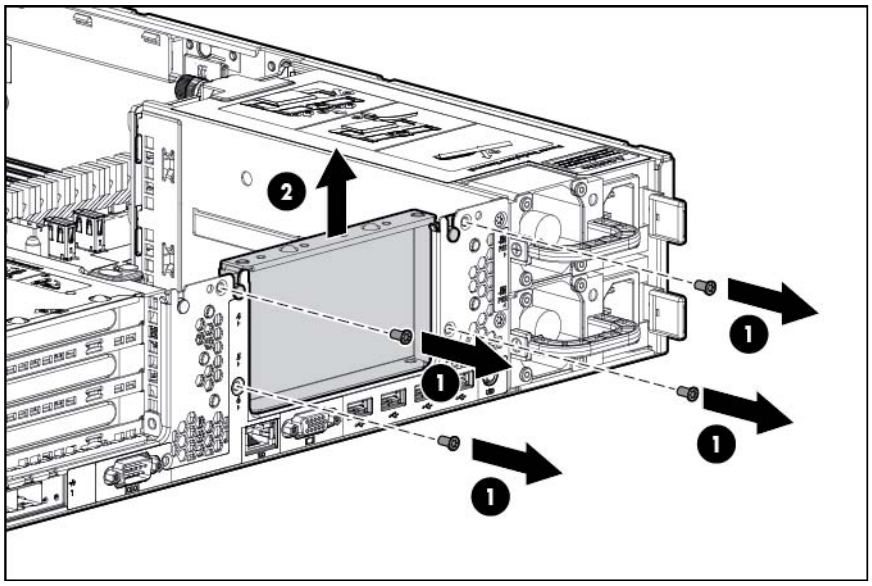
To replace the component, reverse the removal procedure.

PCIe riser blank

△ **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all PCI slots have either an expansion slot cover or an expansion board installed.

To remove the component:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
4. Remove the access panel ("Access panel" on page 33).
5. Remove the PCIe riser blank.



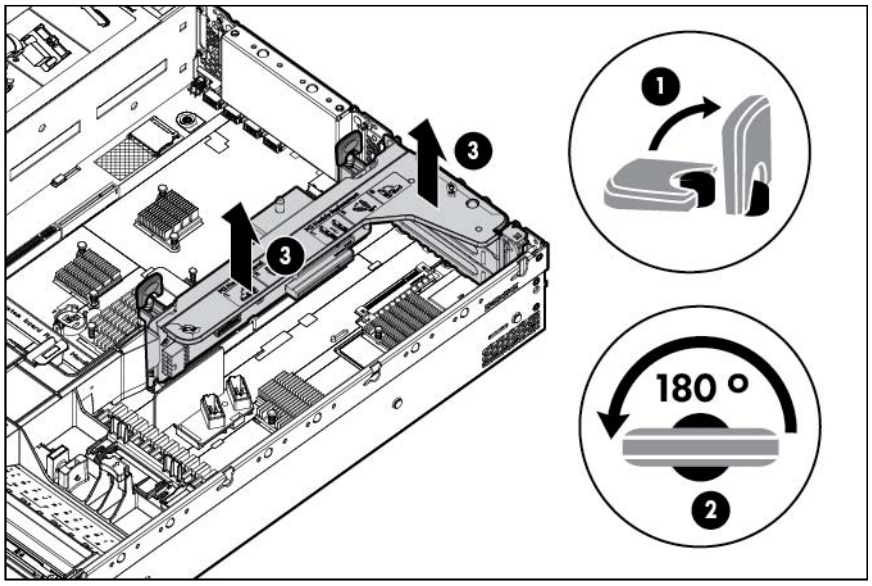
To replace the component, reverse the removal procedure.

Remove the primary PCIe riser cage

CAUTION: To prevent damage to the server or expansion boards, power down the server and remove all AC power cords before removing or installing the PCIe riser cage.

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend the server from the rack (on page 28).
4. Remove the access panel ("Access panel" on page 33).
5. Remove any installed full-length expansion boards ("Full length expansion board" on page 57).

6. Remove the PCIe riser cage.



To install the component, reverse the removal procedure.

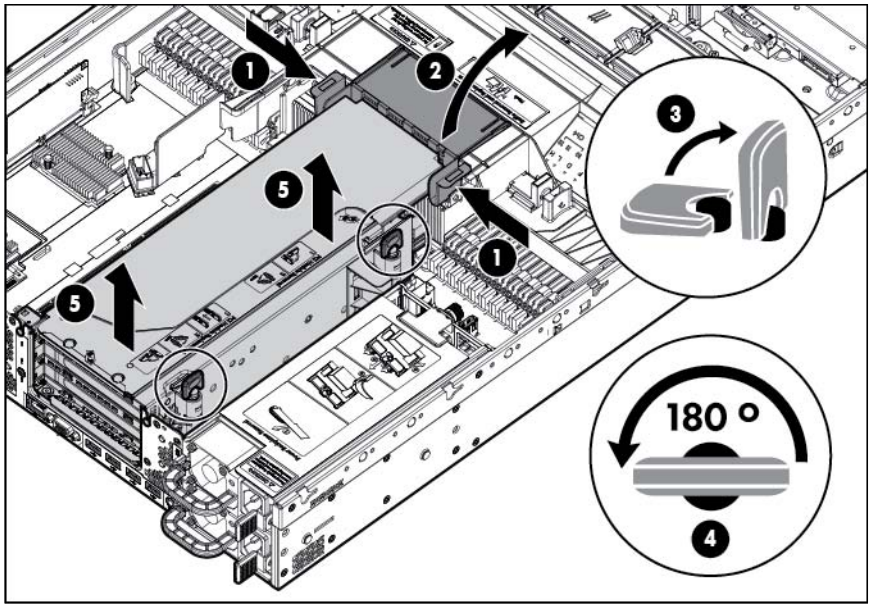
Remove the secondary PCIe riser cage

CAUTION: To prevent damage to the server or expansion boards, power down the server and remove all AC power cords before removing or installing the PCIe riser cage.

To remove the component:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend the server from the rack (on page 28).
4. Remove the access panel ("Access panel" on page 33).

5. If a full-length expansion board is installed in slot 4, release the full-length expansion board retainer, and then remove the PCIe riser cage.



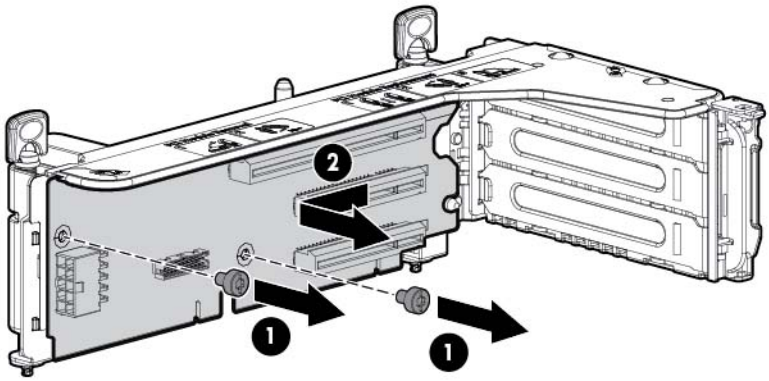
To install the component, reverse the removal procedure.

PCIe riser board

To remove the component:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
4. Remove the access panel ("Access panel" on page 33).
5. If any full-length expansion boards are installed, release the full-length expansion board retainer (on page 31).
6. Remove the PCIe riser cage ("Remove the primary PCIe riser cage" on page 36).
7. Remove any expansion boards from the PCIe riser cage ("Expansion boards" on page 56).

8. Remove the PCIe riser board.

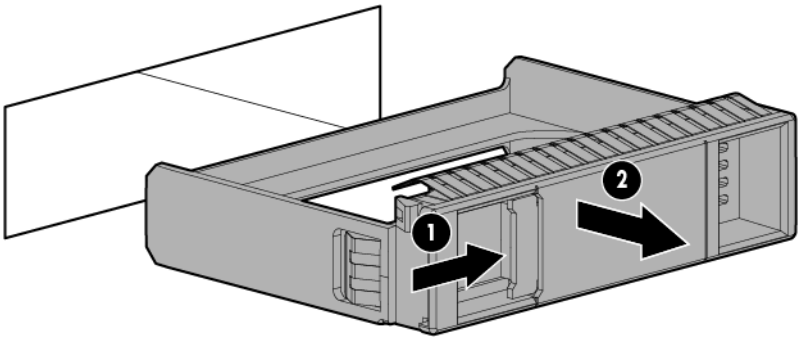


To replace the component, reverse the removal procedure.

Drive blank

CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

Remove the drive blank.



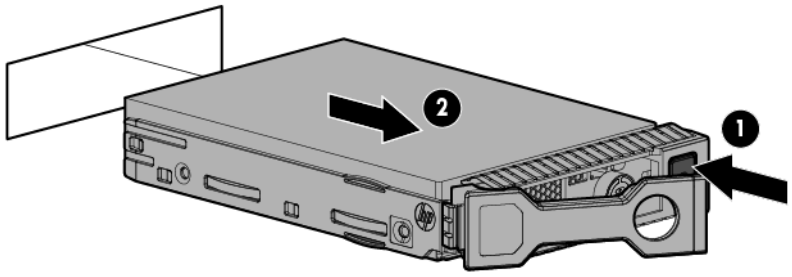
To replace the component, slide the component into the bay until it clicks.

Hot-plug drive

CAUTION: For proper cooling do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.

1. Determine the status of the drive from the hot-plug drive LED definitions ("Drive LED definitions" on page 94).
2. Back up all server data on the drive.

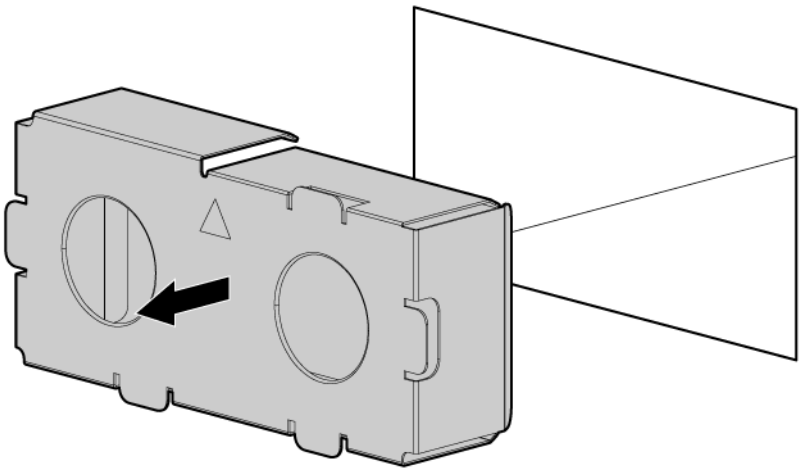
3. Remove the drive.



To replace the component, reverse the removal procedure.

Power supply blank

Remove the blank.



To replace the component, reverse the removal procedure.

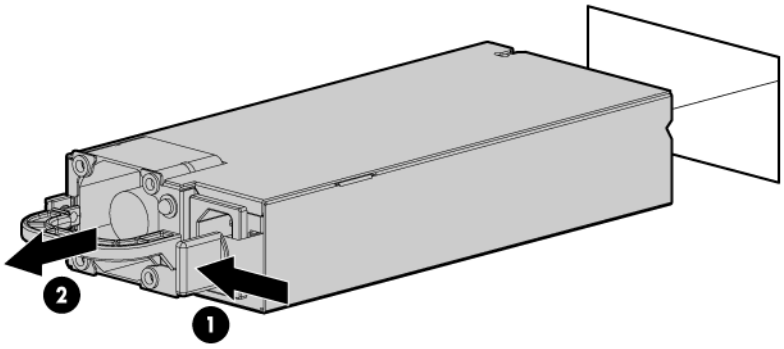
AC power supply

> **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

To remove the component:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Access the product rear panel (on page 30).
4. Remove the power supply.

⚠ **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the power supply or power supply blank to cool before touching it.



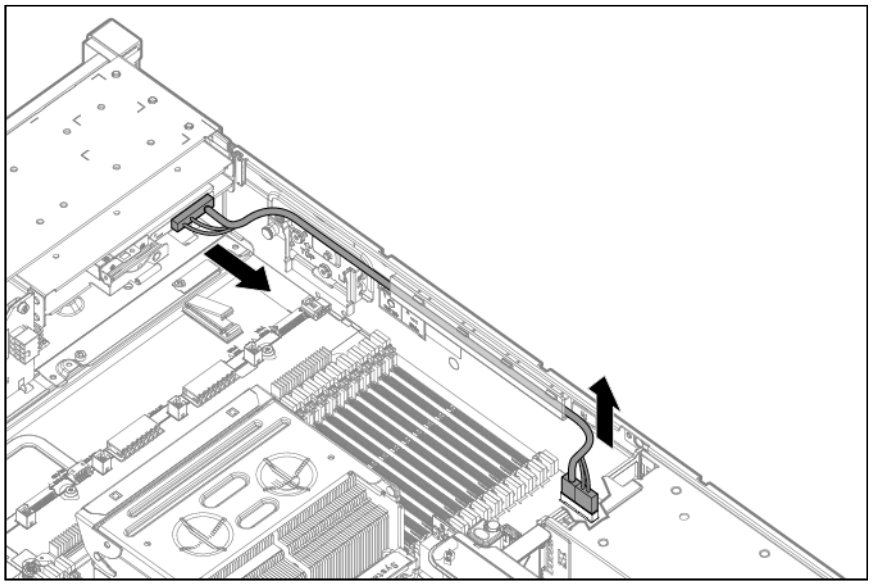
To replace the component, reverse the removal procedure.

Optical drive

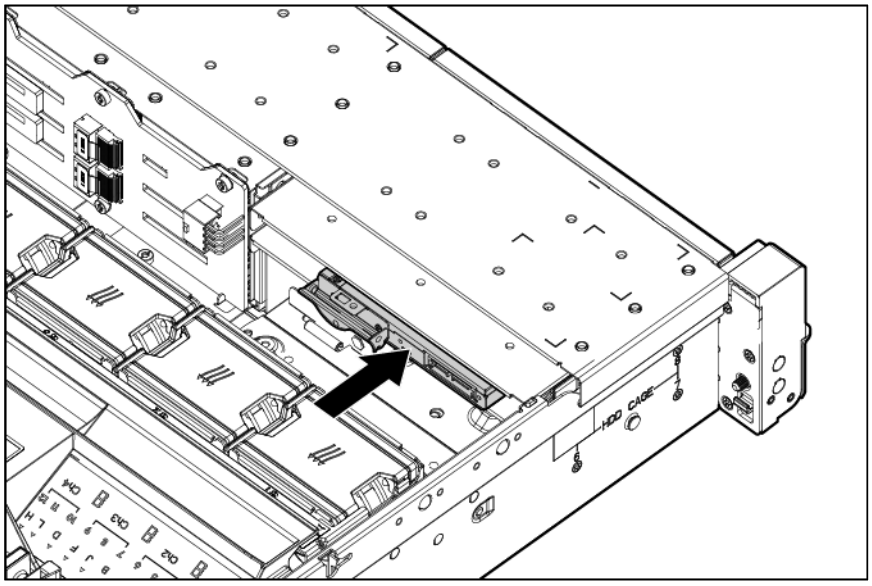
To remove the component:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
4. Remove the access panel ("Access panel" on page 33).
5. Remove the air baffle ("Air baffle" on page 34).
6. Remove the fan cage ("Fan cage" on page 45).

7. Disconnect the optical drive cable.



8. Remove the optical drive.



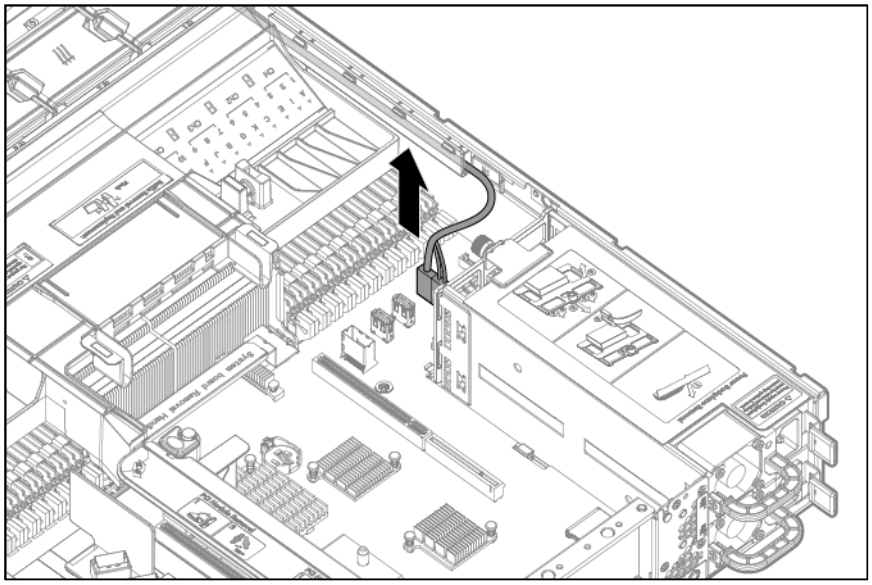
To replace the component, reverse the removal procedure.

Power supply backplane

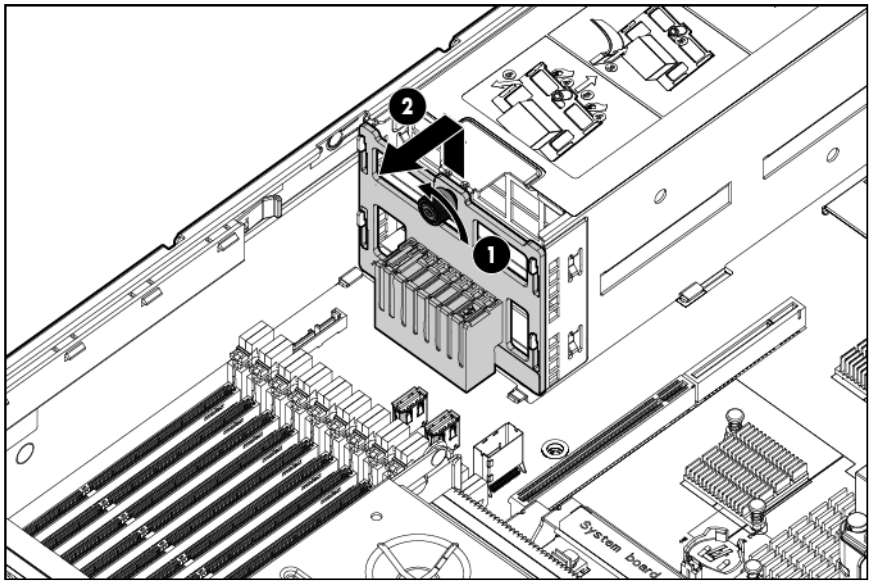
To remove the component:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Remove all power supplies ("AC power supply" on page 40).

4. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
5. Remove the access panel ("Access panel" on page 33).
6. Disconnect the SATA cable.



7. Remove the power supply backplane.



To replace the component, reverse the removal procedure.

Hot-plug fan

The server supports variable fan speeds. The fans operate at minimum speed until a temperature change requires a fan speed increase to cool the server.

The server shuts down in the following temperature-related scenarios:

- At POST:

- The BIOS suspends the server for 5 minutes if it detects a cautionary temperature level. If the cautionary temperature level is still detected after 5 minutes, the BIOS performs an orderly shutdown and enters Standby mode.
- The BIOS performs an orderly shutdown if two or more fans have failed.
- The server performs an immediate shutdown if it detects a critical temperature level.

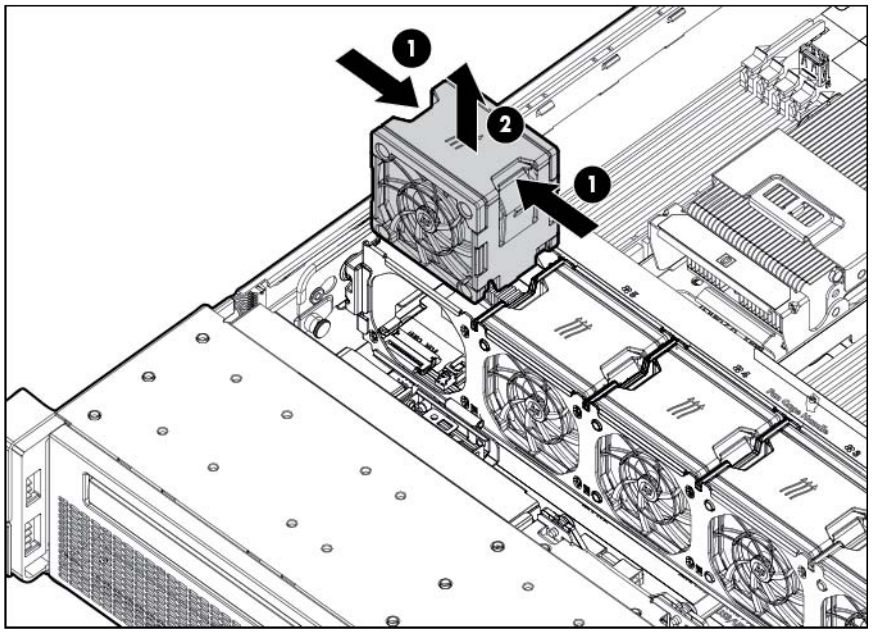
IMPORTANT: An immediate shutdown is a hardware-controlled function and it overrides any firmware or software actions.

- In the operating system:
  - The Health Driver performs an orderly shutdown if it detects a cautionary temperature level. If the server detects a critical temperature level before the orderly shutdown occurs, the server performs an immediate shutdown. Additionally, the Health Driver performs an orderly shutdown if more than one fan is failed or removed.
  - When Thermal Shutdown is disabled in RBSU, the server performs an immediate shutdown if it detects a critical temperature level.

IMPORTANT: An immediate shutdown is a hardware-controlled function and it overrides any firmware or software actions.

To remove the component:

1. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
2. Remove the access panel ("Access panel" on page 33).
3. Remove the fan.



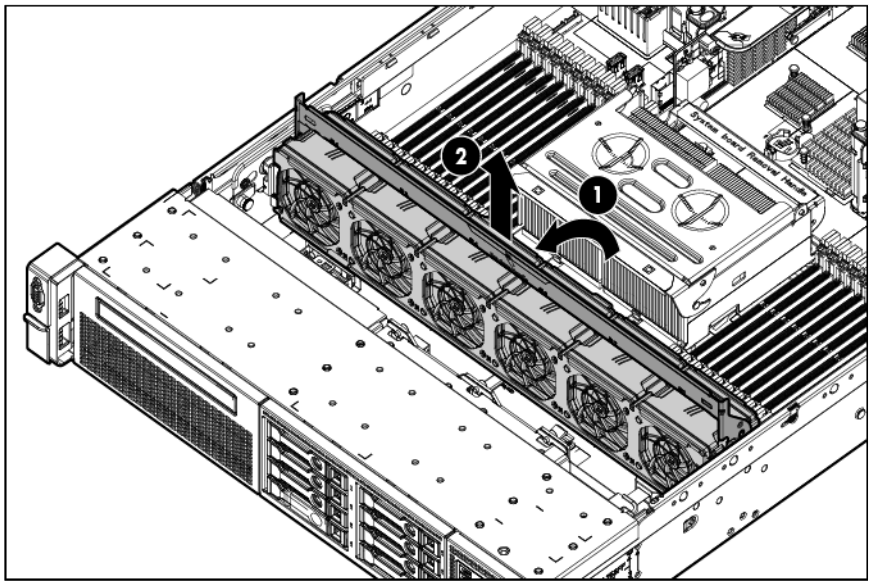
CAUTION: Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.

To replace the component, reverse the removal procedure.

Fan cage

To remove the component:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
4. Remove the access panel ("Access panel" on page 33).
5. Remove the air baffle ("Air baffle" on page 34).
6. Remove the fan cage.



CAUTION: Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.

IMPORTANT: For optimum cooling, install fans in all primary fan locations. For more information, refer to the fan locations table ("Hot-plug fans" on page 96).

To replace the component, reverse the removal procedure.

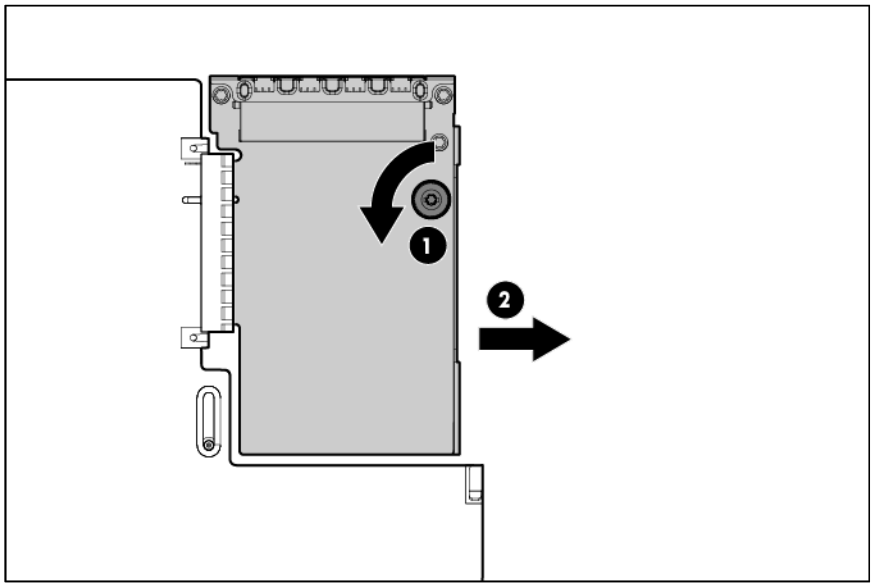
FlexibleLOM

WARNING: To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

1. Power down the server (on page 27).

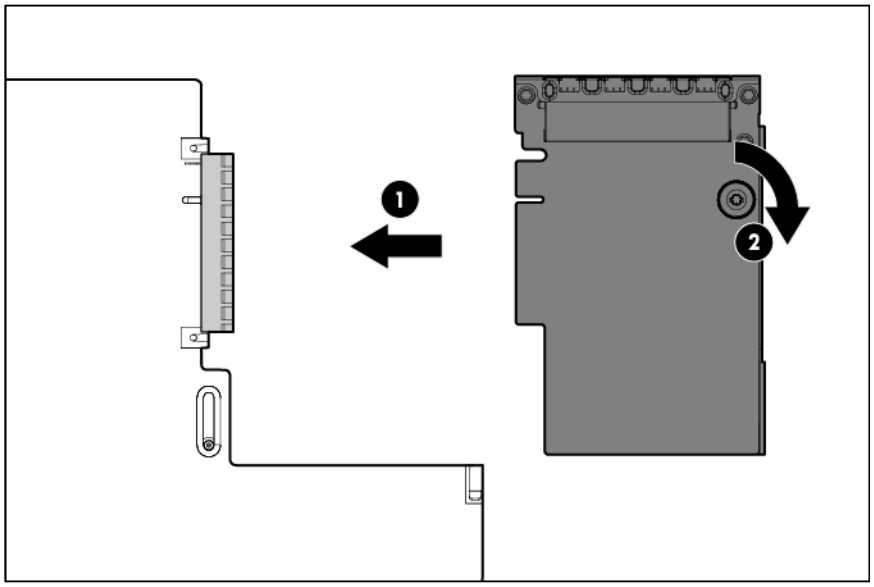
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Remove any attached network cables.
4. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
5. Remove the access panel ("Access panel" on page 33).
6. Remove the primary PCIe riser cage (on page 36).
7. Loosen the thumbscrew.
8. Remove the existing FlexibleLOM.

   Pull the FlexibleLOM toward the front of the server while removing it, to avoid catching it on the rear chassis.



To replace the component:

1. Firmly seat the FlexibleLOM in the slot, and then tighten the thumbscrew.



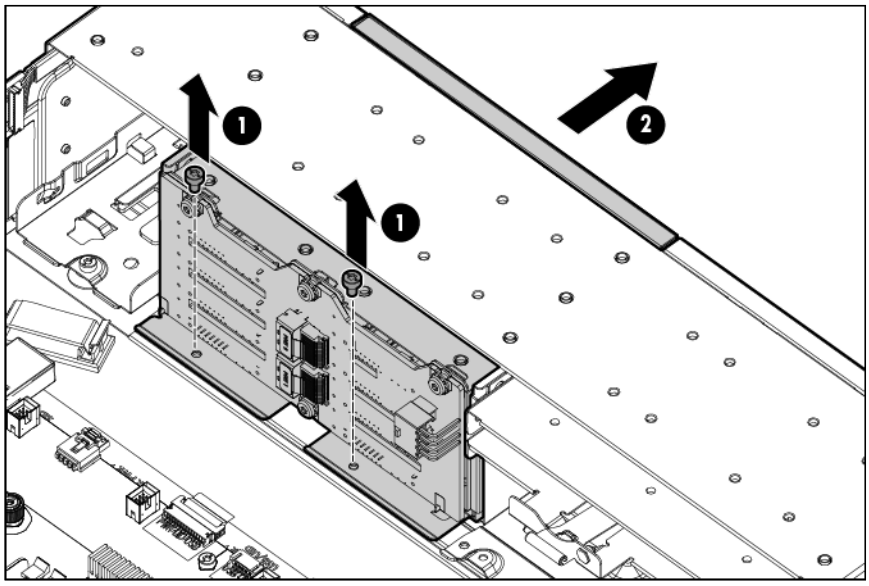
2. Install the PCIe riser cage ("Remove the primary PCIe riser cage" on page 36).
3. Install the access panel ("Access panel" on page 33).
4. Slide the server into the rack.
5. Connect the LAN segment cables.
6. Connect each power cord to the server.
7. Connect each power cord to the power source.
8. Power up the server.

SFF hard drive cage

To remove the component:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
4. Remove the access panel ("Access panel" on page 33).
5. Remove all hot-plug hard drives ("Hot-plug drive" on page 39).
6. Remove the air baffle ("Air baffle" on page 34).
7. Remove the fan cage ("Fan cage" on page 45).
8. Disconnect all cables from the hard drive backplane.

9. Remove the hard drive cage.



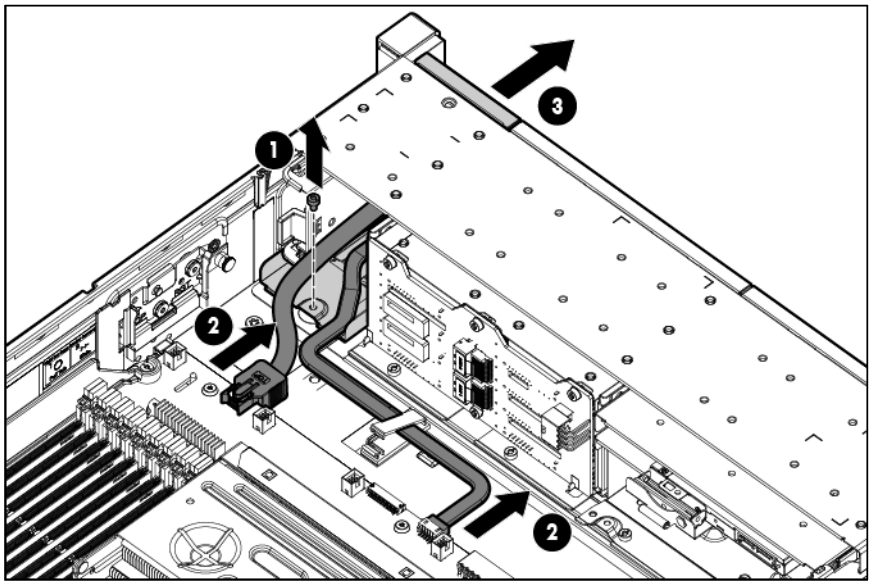
To replace the component, reverse the removal procedure.

Systems Insight Display

To remove the component:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
4. Remove the access panel ("Access panel" on page 33).
5. Remove the air baffle ("Air baffle" on page 34).
6. Remove the fan cage ("Fan cage" on page 45).
7. Remove the Systems Insight Display:
   a. Remove the screw from the rear of the Systems Insight Display.
   b. Disconnect the Systems Insight Display cable and the USB cable from the system board, and disconnect the USB cable from the front of the Systems Insight Display.

c. Remove the Systems Insight Display.

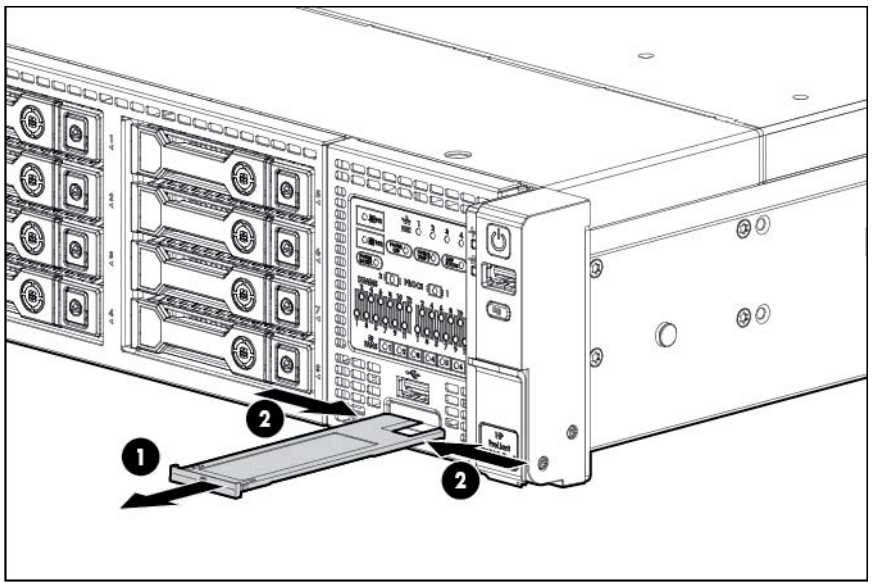


To replace the component, reverse the removal procedure.

Front panel assembly

To remove the component:

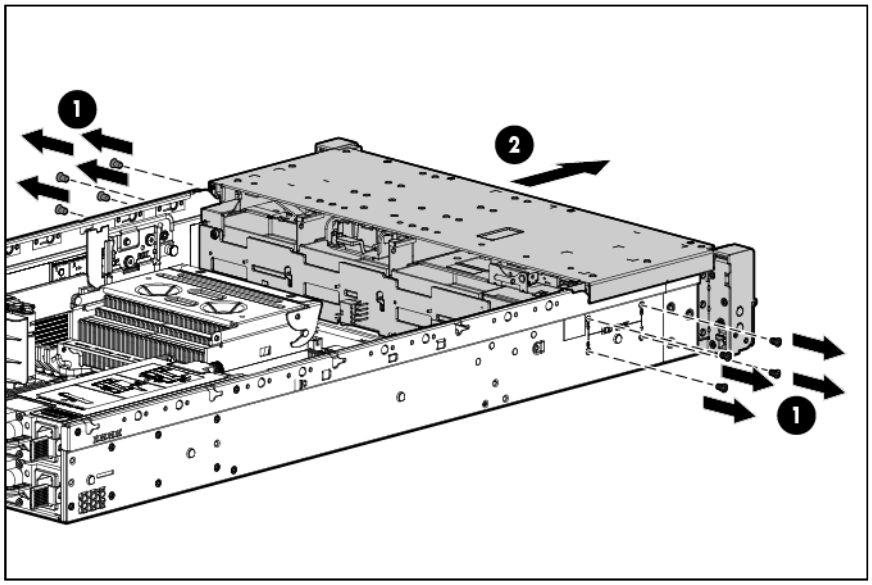
1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Remove the server from the rack (on page 29).
4. Remove the access panel ("Access panel" on page 33).
5. Remove the serial label pull tab, and retain it for the new front panel assembly.



6. Remove the air baffle ("Air baffle" on page 34).
7. Remove all drives ("Hot-plug drive" on page 39).
8. If installed, remove the optical drive ("Optical drive" on page 41).
9. Remove the fan cage ("Fan cage" on page 45).
10. Disconnect all cables from the front panel assembly.

IMPORTANT: If any cables in the front panel assembly need replacing, the entire front panel assembly must be replaced.

11. Remove the four T-10 Torx screws from each side, and then remove the front panel assembly.



To replace the component, reverse the removal procedure.

Flash-backed write cache procedures

Two types of procedures are provided for the FBWC option:

- Removal and replacement of failed components:
  - Removing the cache module ("Flash-backed write cache module" on page 50)
  - Removing the capacitor pack ("Flash-backed write cache capacitor pack" on page 52)
- Recovery of cached data from a failed server ("Recovering data from the flash-backed write cache" on page 54)

CAUTION: Do not detach the cable that connects the battery pack or capacitor pack to the cache module. Detaching the cable causes any unsaved data in the cache module to be lost.

Flash-backed write cache module

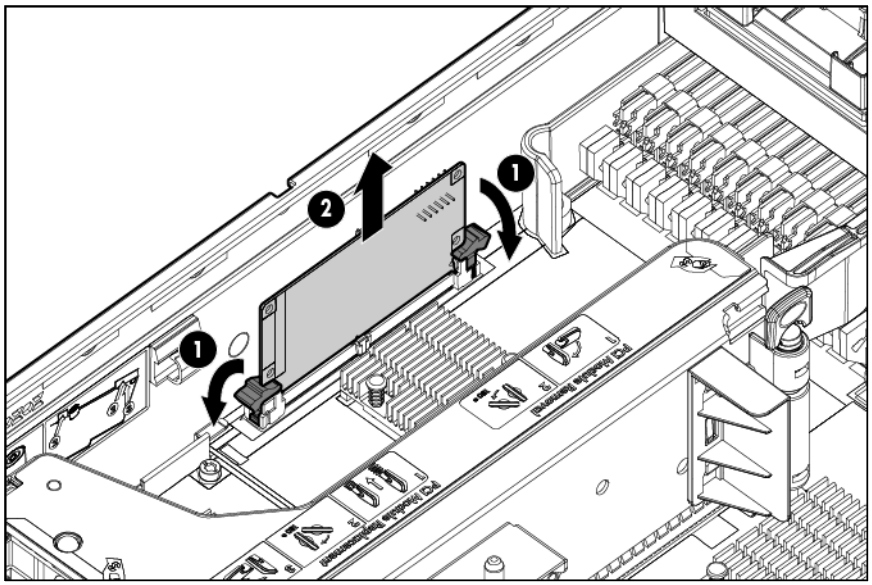
To remove the component:

CAUTION: The cache module connector does not use the industry-standard DDR3 mini-DIMM pinout. Do not use this controller with cache modules designed for other controller models, because the controller can malfunction and you can lose data. Also, do not transfer this cache module to an unsupported controller model, because you can lose data.

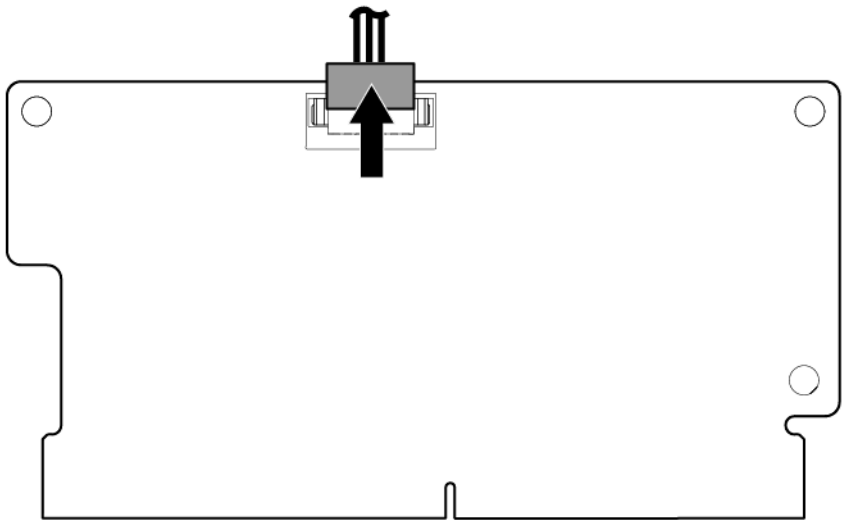
1. Back up all data.
2. Close all applications.
3. Power down the server (on page 27).
4. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.

CAUTION: In systems that use external data storage, be sure that the server is the first unit to be powered down and the last to be powered back up. Taking this precaution ensures that the system does not erroneously mark the drives as failed when the server is powered up.

5. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
6. Remove the access panel ("Access panel" on page 33).
7. If it is populated with expansion boards, remove the PCIe riser cage for better access ("Remove the primary PCIe riser cage" on page 36).
8. If the existing cache module is connected to a capacitor pack, observe the FBWC module LEDs:
   - If the amber LED is flashing, data is trapped in the cache. Restore system power, and restart this procedure from step 1.
   - If the amber LED is not illuminated, remove the controller from the server, and then continue with the next step.
9. Open the ejector latches on each side of the cache module connector. Normally, the cache module is ejected from the cache module connector. If the module is not ejected automatically, remove the cache module.



10. If the cache module is connected to a capacitor pack, disconnect the capacitor pack cable from the connector on the top of the cache module.



To replace the component, reverse the removal procedure.

> **CAUTION:** To prevent damage to the cache module during installation, be sure the cache module is fully inserted before pressing down.

Flash-backed write cache capacitor pack

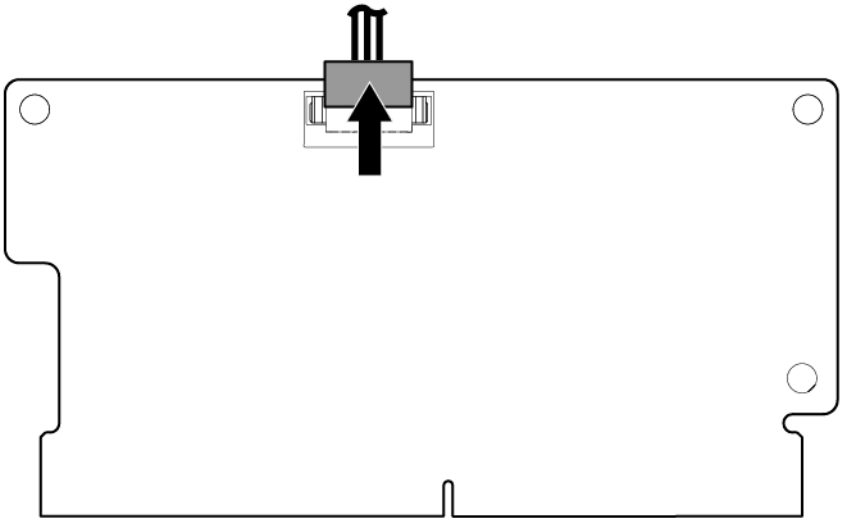
To remove the component:

1. Back up all data.
2. Close all applications.
3. Power down the server (on page 27).
4. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.

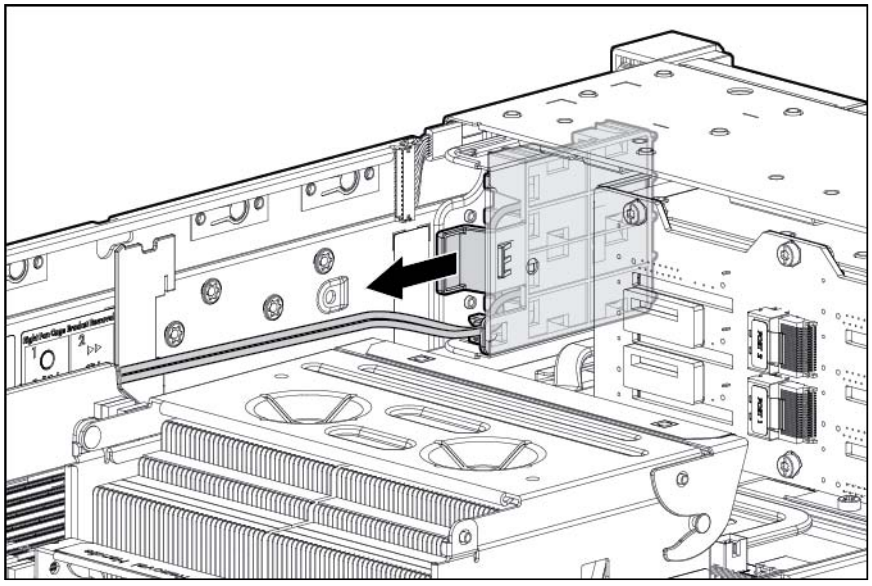
> **CAUTION:** In systems that use external data storage, be sure that the server is the first unit to be powered down and the last to be powered back up. Taking this precaution ensures that the system does not erroneously mark the drives as failed when the server is powered up.

5. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
6. Remove the access panel ("Access panel" on page 33).
7. If it is populated with expansion boards, remove the PCIe riser cage for better access ("Remove the primary PCIe riser cage" on page 36).

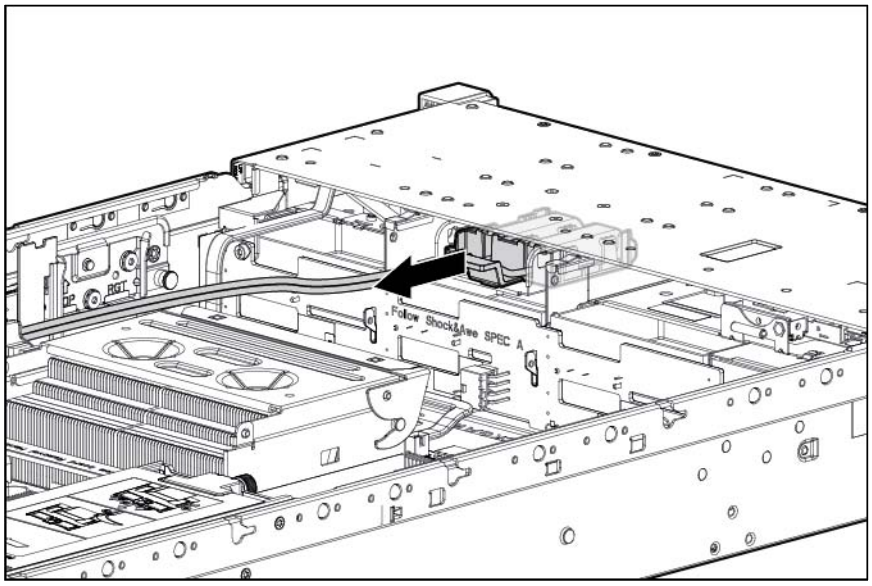
8. If the capacitor pack is connected to the cache module, disconnect the capacitor pack cable from the connector on the top of the cache module.



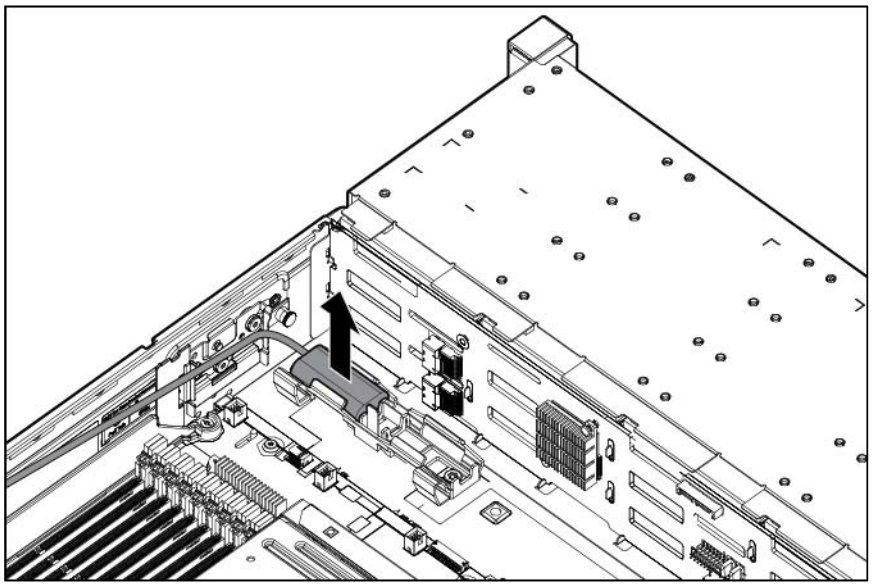
9. Disconnect the SAS hard drive backplane ribbon cable, and then remove the right fan bracket.
10. Remove the capacitor pack.
    - 8 or 16 SFF configuration



- 8 LFF configuration



- 12 LFF or 25 SFF configuration



To replace the component, reverse the removal procedure.

Recovering data from the flash-backed write cache

If the server fails, use the following procedure to recover data temporarily stored in the FBWC.

CAUTION: Before starting this procedure, read the information about protecting against electrostatic discharge ("Preventing electrostatic discharge" on page 32).

1. Perform one of the following:
   - Set up a recovery server station using an identical server model. Do not install any internal drives or FBWC in this server. (HP recommends this option.)

- Find a server that has enough empty drive bays to accommodate all the drives from the failed server and that meets all the other requirements for drive and array migration.

2. Power down the failed server ("Power down the server" on page 27).
3. Transfer the hard drives from the failed server to the recovery server station.
4. Perform one of the following:
   - If the array controller has failed, remove the cache module and capacitor pack from the failed array controller, and install the cache module and capacitor pack on an identical array controller model in the recovery server.
   - If the server has failed, remove the controller ("Half-length expansion board" on page 56), cache module, and capacitor pack from the failed server, and install the controller, cache module, and capacitor pack in the recovery server.
5. Power up the recovery server. If there was data in the cache at the time of the controller or server failure, a 1792 POST message appears, stating that valid data was flushed from the cache. This data is now stored on the drives in the recovery server. You can now transfer the drives (and controller, if one is used) to another server.

   If the drives are migrated to different drive positions or there are volumes present in the recovery server, a 1724 POST message appears, stating that logical drive configuration has been updated automatically.

Expansion slot blanks

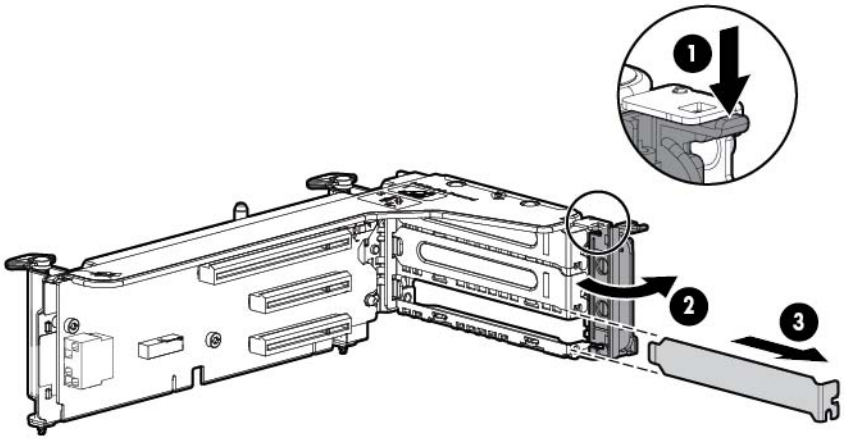
⚠ **WARNING:** To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

△ **CAUTION:** For proper cooling do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.

To remove the component:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
4. Remove the access panel ("Access panel" on page 33).
5. Disconnect any external cables that are connected to the expansion board.
6. Disconnect any internal cables that are connected to the expansion board.
7. Remove the PCIe riser cage ("Remove the primary PCIe riser cage" on page 36, "Remove the secondary PCIe riser cage" on page 37).

8. Remove the expansion slot blank.



To replace the component, reverse the removal procedure.

Expansion boards

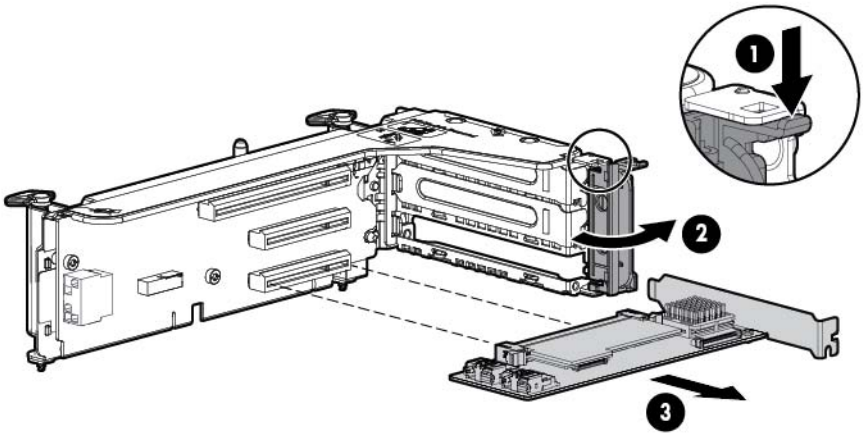
Half-length expansion board

⚠ **WARNING:** To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

To remove the component:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
4. Remove the access panel ("Access panel" on page 33).
5. Disconnect any external cables that are connected to the expansion board.
6. Disconnect any internal cables that are connected to the expansion board.
7. Remove the PCIe riser cage ("Remove the primary PCIe riser cage" on page 36).

8. Remove the expansion board.



To replace the component, reverse the removal procedure.

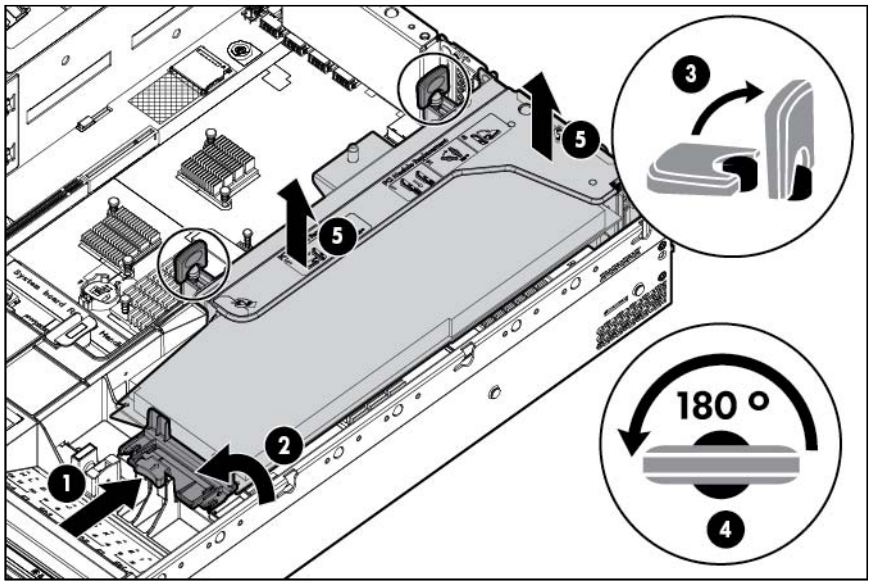
Full length expansion board

> ⚠ **WARNING:** To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

To remove the component:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
4. Remove the access panel ("Access panel" on page 33).
5. Disconnect any external cables that are connected to the expansion board.
6. Disconnect any internal cables that are connected to the expansion board.

7. Release the full-length expansion board retainer, and then remove the PCIe riser cage.



8. Remove the full-length expansion board.

To replace the component, reverse the removal procedure.

Heatsink

WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

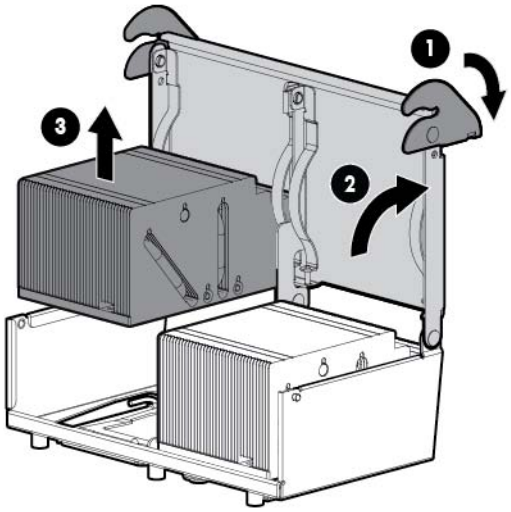
CAUTION: The heatsink thermal interface media is not reusable and must be replaced if the heatsink is removed from the processor after it has been installed.

CAUTION: To avoid thermal shutdown, all fans must be installed in a dual processor configuration.

To remove the component:

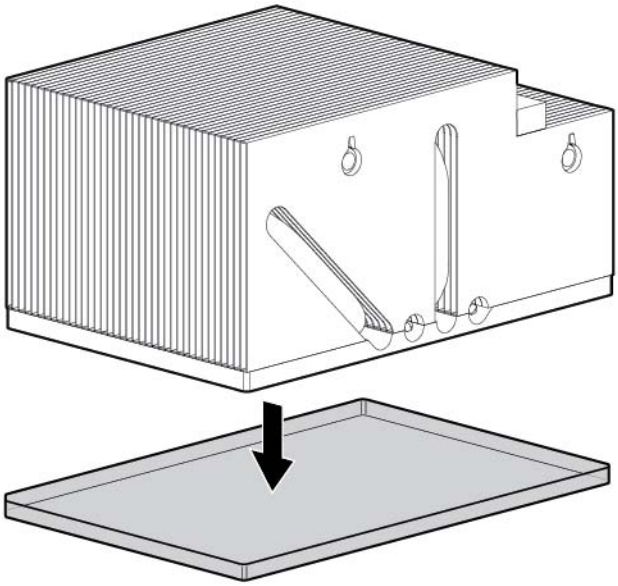
1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
4. Remove the access panel ("Access panel" on page 33).
5. Remove the air baffle ("Air baffle" on page 34).

6. Remove the heatsink.

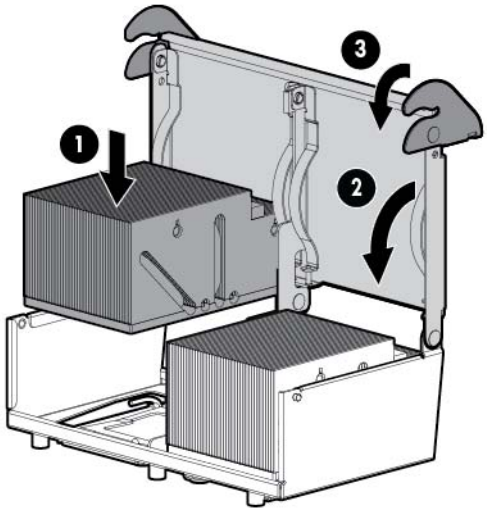


To replace the component:

1. Remove the thermal interface protective cover from the heatsink.



2. Install the heatsink.



3. Install the air baffle ("Air baffle" on page 34).
4. Install the access panel ("Access panel" on page 33).
5. Slide the server into the rack.
6. Connect each power cord to the server.
7. Connect each power cord to the power source.
8. Power up the server.

Processor

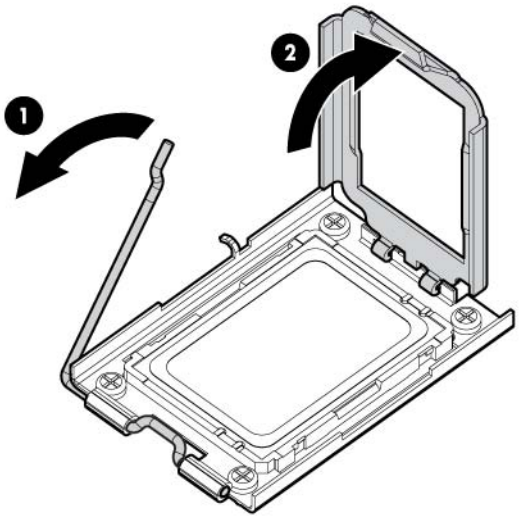
CAUTION: To avoid damage to the processor and system board, only authorized personnel should attempt to replace or install the processor in this server.

CAUTION: To prevent possible server malfunction and damage to the equipment, multiprocessor configurations must contain processors with the same part number.

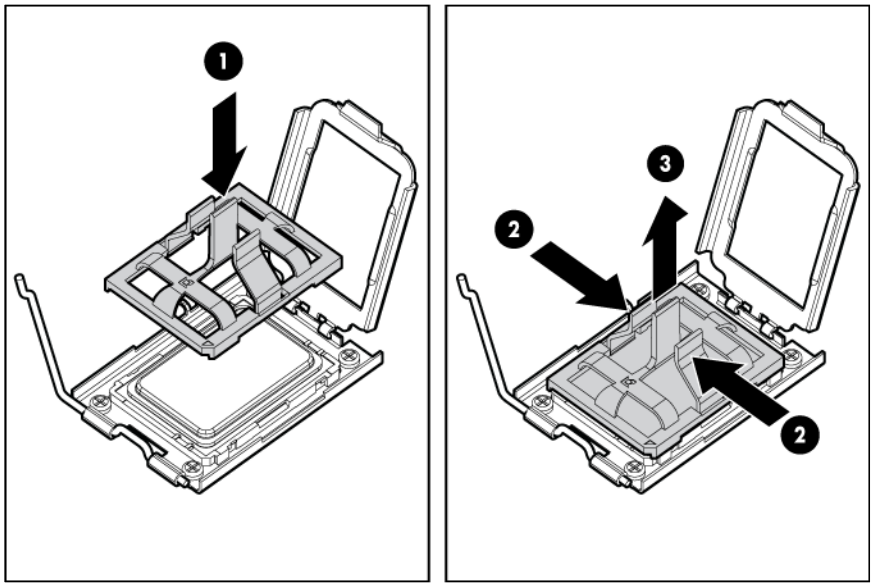
To remove a processor:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend or remove the server from the rack ("Extend the server from the rack" on page 28).
4. Remove the access panel ("Access panel" on page 33).
5. Remove the air baffle ("Air baffle" on page 34).

6. Open the processor socket retaining bracket and the processor locking lever.



7. Using the processor tool, remove the processor from the system board.

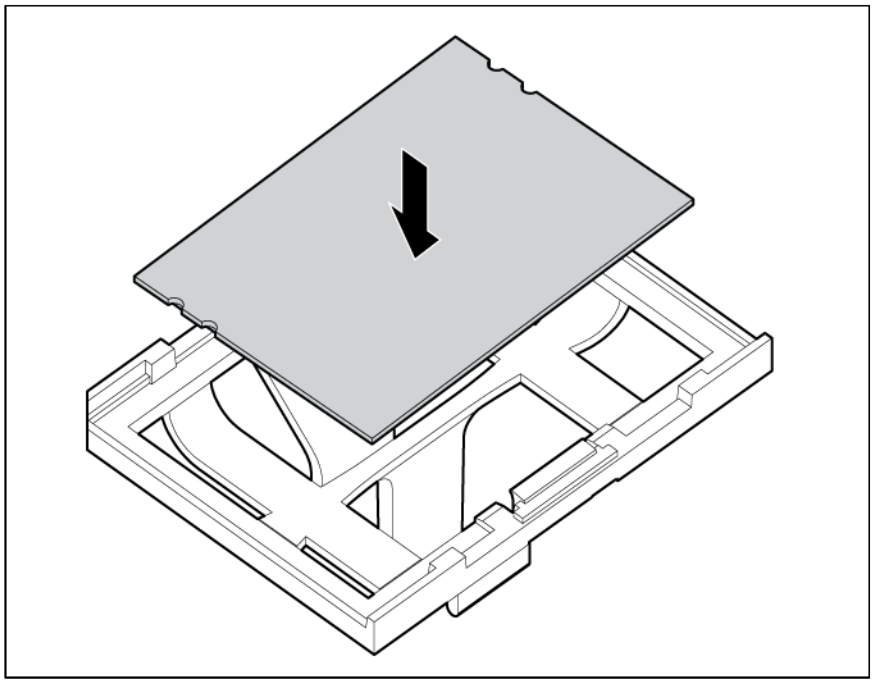


△ **CAUTION:** To avoid damage to the processor, do not touch the bottom of the processor, especially the contact area.

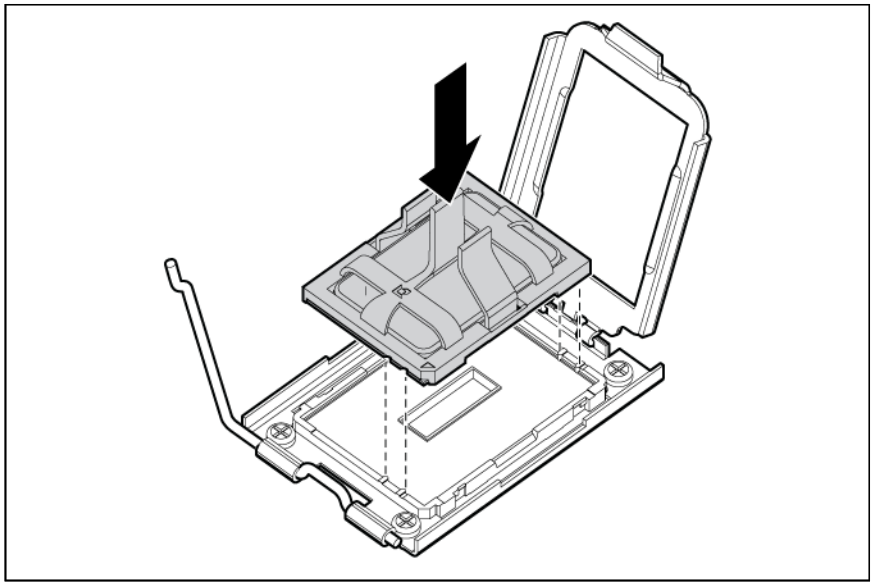
To replace a processor:

IMPORTANT: Be sure the processor remains inside the processor installation tool.

1. If the processor has separated from the installation tool, carefully re-insert the processor in the tool. Handle the processor by the edges only, and do not touch the bottom of the processor, especially the contact area.



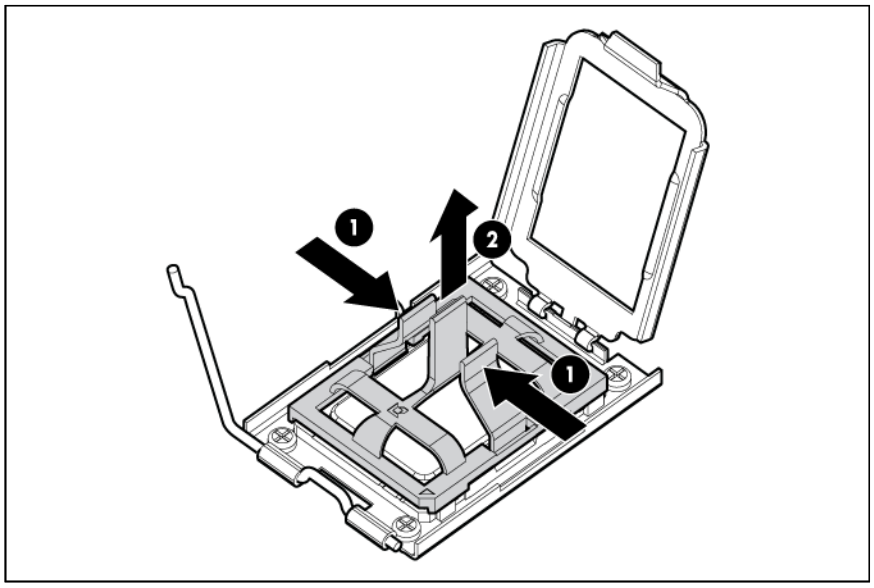
2. The processor fits one way into the socket. Use the alignment guides on the processor and socket to properly align the processor with the socket. Install the spare processor. **THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED**.



△ **CAUTION: THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED.** To avoid damage to the system board:

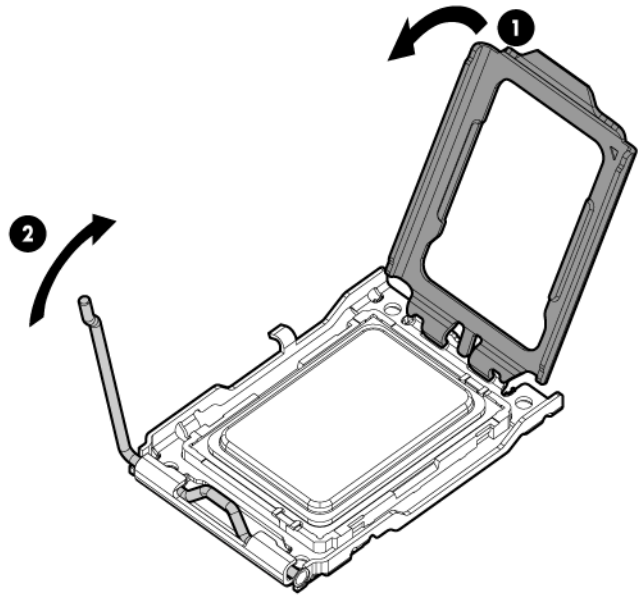
- Never install or remove a processor without using the processor installation tool.
- Do not touch the processor socket contacts.
- Do not tilt or slide the processor when lowering the processor into the socket.

3. Press the tabs on the processor tool to release the processor, and then remove the processor tool.



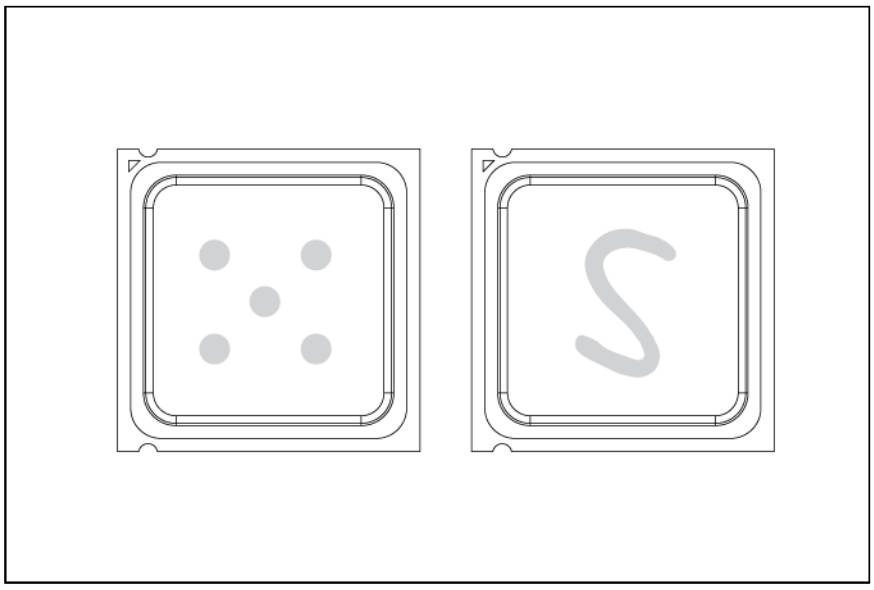
4. Close the processor socket retaining bracket and the processor locking lever.

△ **CAUTION:** Be sure to close the processor socket retaining bracket before closing the processor locking lever. The lever should close without resistance. Forcing the lever closed can damage the processor and socket, requiring system board replacement.

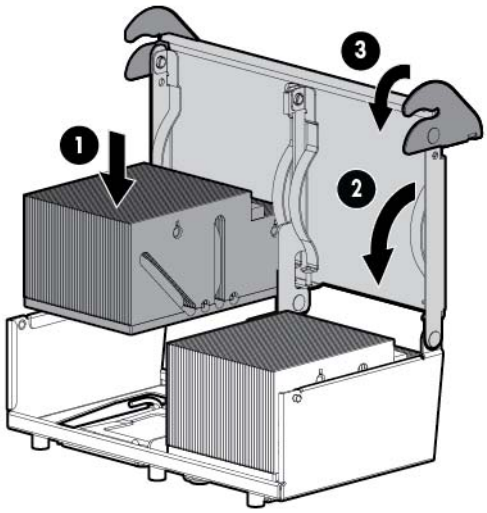


5. Clean the old thermal grease from the heatsink with the alcohol swab. Allow the alcohol to evaporate before continuing.

6. Apply all the grease to the top of the processor in one of the following patterns to ensure even distribution.



7. Install the heatsink.



8. Install the air baffle ("Air baffle" on page 34).
9. Install the access panel ("Access panel" on page 33).
10. Install the server into the rack.
11. Connect each power cord to the server.
12. Connect each power cord to the power source.
13. Power up the server.

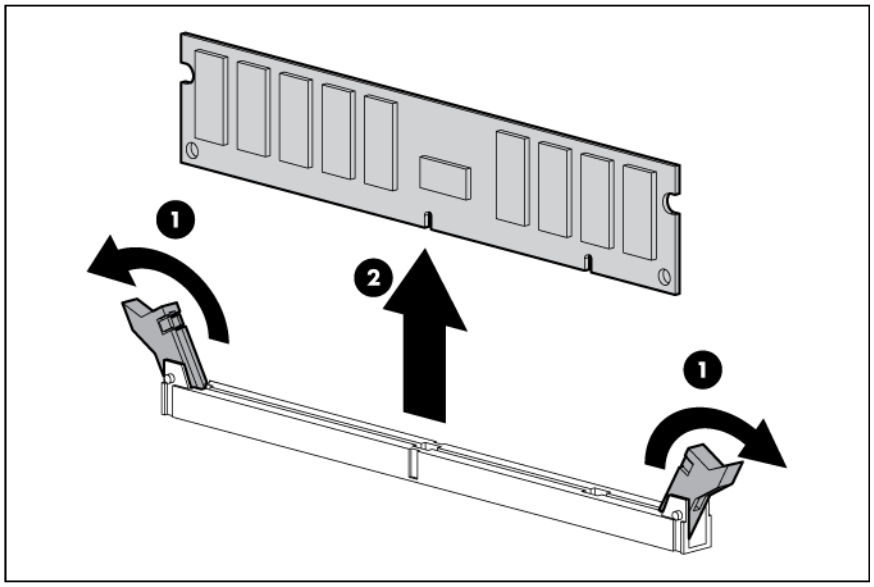
DIMMs

IMPORTANT: This server does not support mixing RDIMMs and UDIMMs. Attempting to mix these two types causes the server to halt during BIOS initialization.

To identify the DIMMs installed in the server, see "DIMM slot locations (on page 92)."

To remove the component:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
4. Remove the access panel ("Access panel" on page 33).
5. Remove the air baffle ("Air baffle" on page 34).
6. Remove the DIMM.



To replace the component, reverse the removal procedure.

For DIMM configuration information, see the server user guide.

System battery

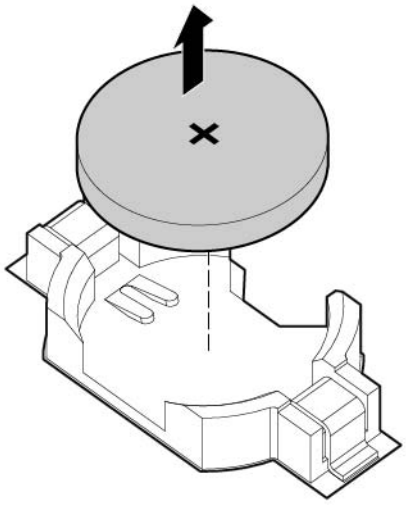
If the server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock.

WARNING: The computer contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery pack. A risk of fire and burns exists if the battery pack is not properly handled. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
- Replace only with the spare designated for this product.

To remove the component:

1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
4. Remove the access panel ("Access panel" on page 33).
5. If installed, remove the secondary PCIe riser cage (on page 37).
6. Locate the battery ("System board components" on page 90).
7. Remove the battery.



To replace the component, reverse the removal procedure.

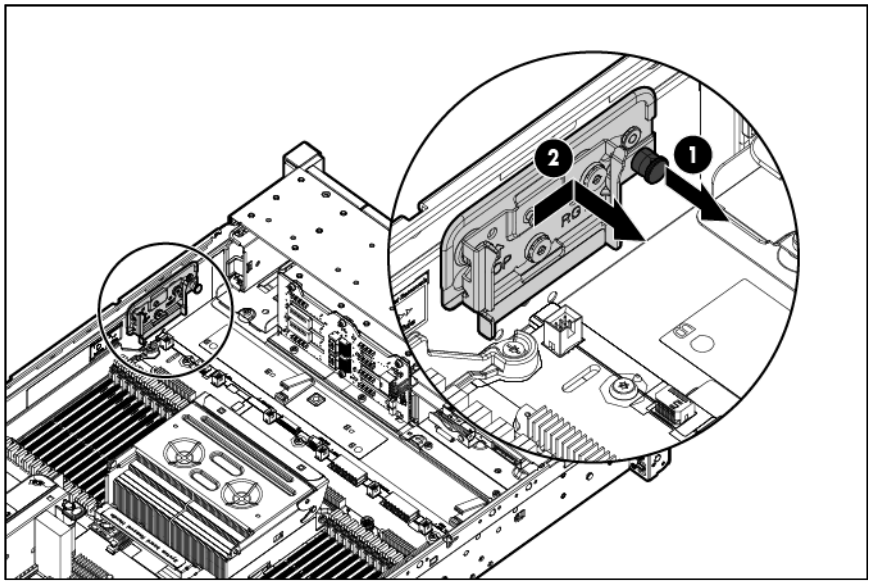
For more information about battery replacement or proper disposal, contact an authorized reseller or an authorized service provider.

System board

To remove the component:

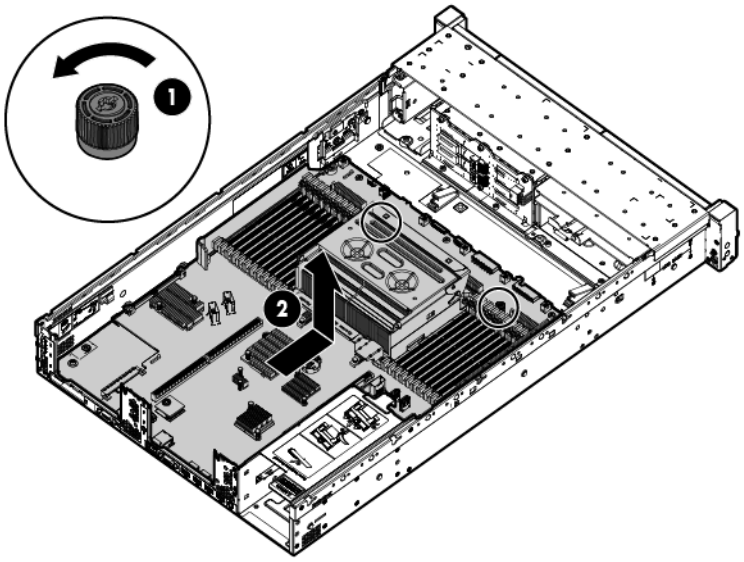
1. Power down the server (on page 27).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Remove the server from the rack (on page 29).
4. Remove all power supplies ("AC power supply" on page 40).
5. Remove the access panel ("Access panel" on page 33).
6. Remove the air baffle ("Air baffle" on page 34).

7. Remove the PCIe riser cage ("Remove the primary PCIe riser cage" on page 36, "Remove the secondary PCIe riser cage" on page 37).
8. If installed, remove the secondary PCIe riser cage (on page 37).
9. If installed, remove the FBWC capacitor pack ("Flash-backed write cache capacitor pack" on page 52).
10. If installed, remove the cache module ("Flash-backed write cache module" on page 50).
11. Remove the FlexibleLOM ("FlexibleLOM" on page 45).
12. Remove all DIMMs ("DIMMs" on page 64).
13. Remove the fan cage ("Fan cage" on page 45).
14. Remove the power supply backplane ("Power supply backplane" on page 42).
15. Disconnect all cables connected to the system board.
16. Remove the heatsink ("Heatsink" on page 58).
17. Remove the processor ("Processor" on page 60).
18. Remove left and right fan cage brackets.



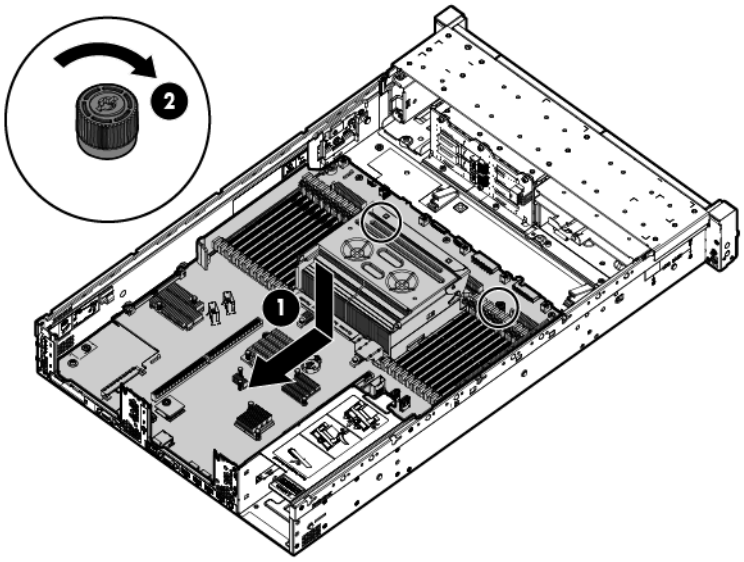
19. Loosen the system board thumbscrews.

20. Remove the system board, using the handle to lift it out of the chassis.



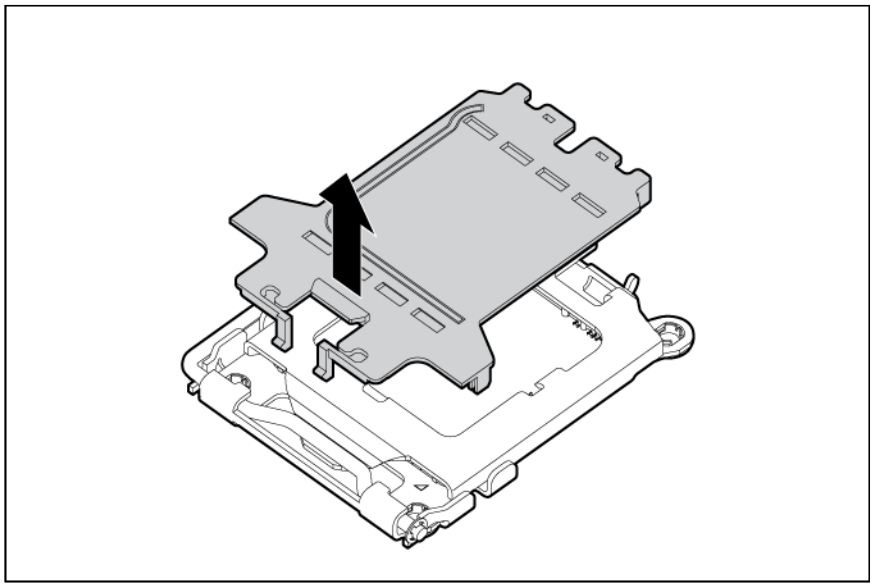
To replace the component:

1. Install the spare system board.

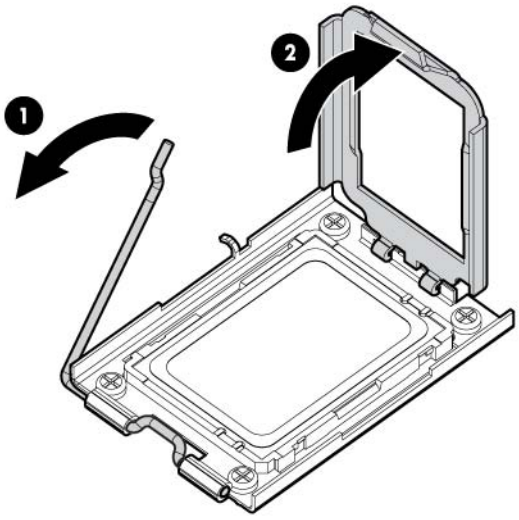


2. Prepare the processor socket on the spare system board.

a. Remove the processor socket protective cover.



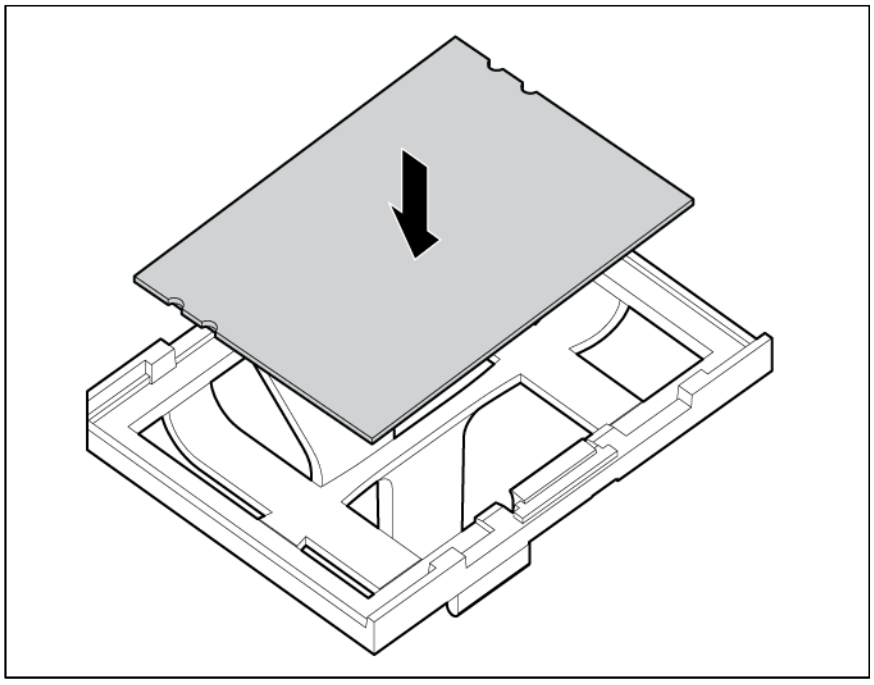
b. Open the processor retaining latch and the processor socket retaining bracket.



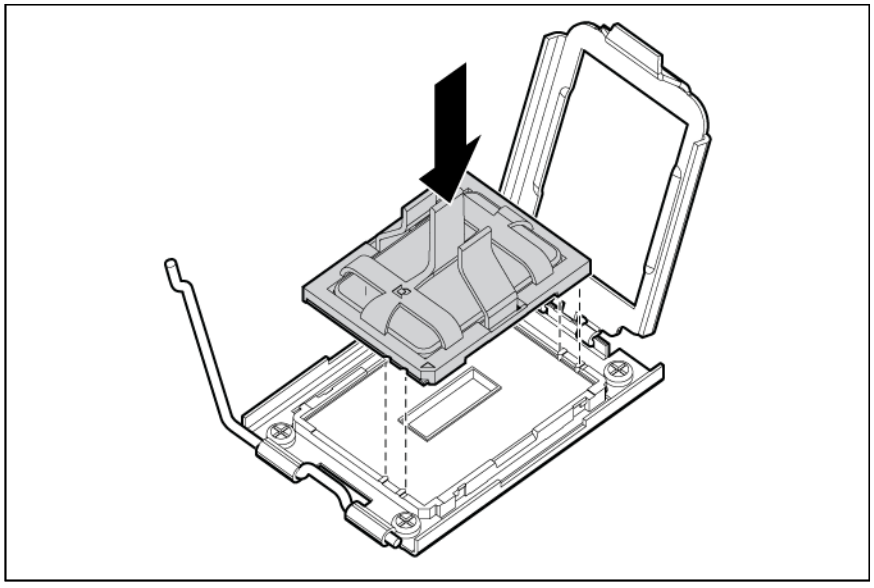
3. Install the processor socket cover onto the processor socket of the failed system board.
4. Install the processor on the spare system board.

IMPORTANT: Be sure the processor remains inside the processor installation tool.

5. If the processor has separated from the installation tool, carefully re-insert the processor in the tool. Handle the processor by the edges only, and do not touch the bottom of the processor, especially the contact area.



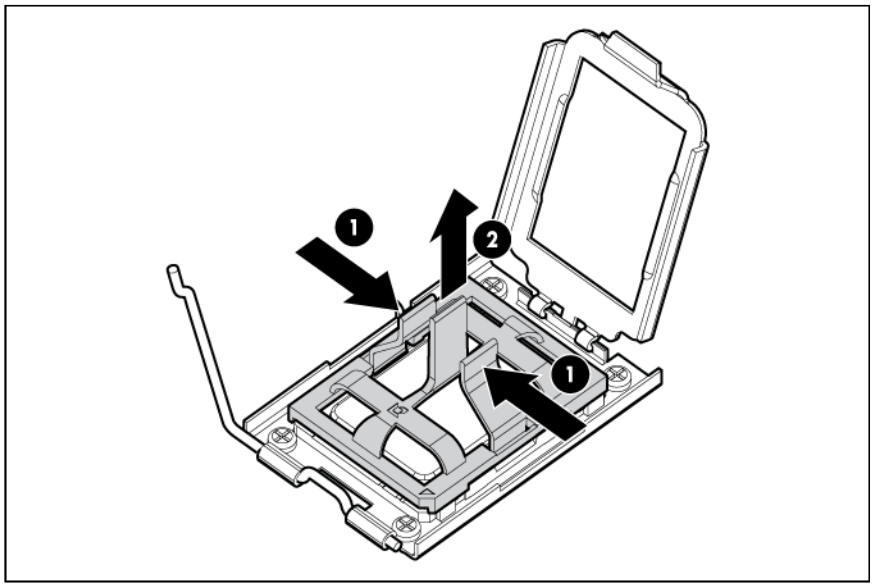
6. The processor fits one way into the socket. Use the alignment guides on the processor and socket to properly align the processor with the socket. Install the spare processor. **THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED**.



△ **CAUTION: THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED.** To avoid damage to the system board:

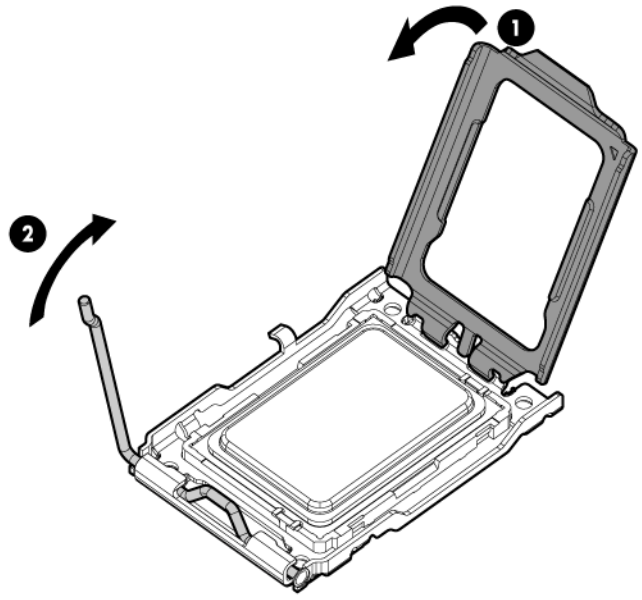
- Never install or remove a processor without using the processor installation tool.
- Do not touch the processor socket contacts.
- Do not tilt or slide the processor when lowering the processor into the socket.

7. Press the tabs on the processor tool to release the processor, and then remove the processor tool.



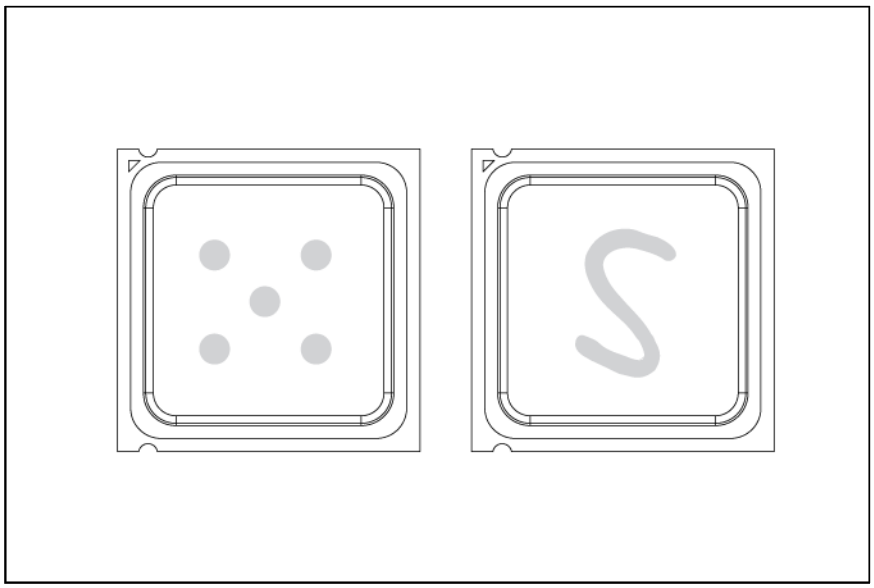
8. Close the processor socket retaining bracket and the processor locking lever.

△ **CAUTION:** Be sure to close the processor socket retaining bracket before closing the processor locking lever. The lever should close without resistance. Forcing the lever closed can damage the processor and socket, requiring system board replacement.

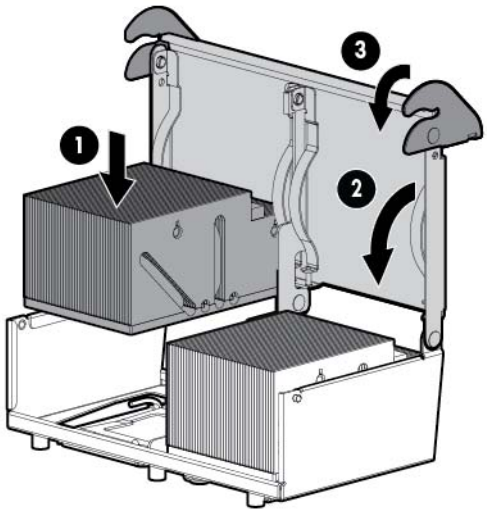


9. Clean the old thermal grease from the heatsink with the alcohol swab. Allow the alcohol to evaporate before continuing.

10. Apply all the grease to the top of the processor in one of the following patterns to ensure even distribution.



11. Install the heatsink.



IMPORTANT: Install all components with the same configuration that was used on the failed system board.

12. Install all components removed from the failed system board.
13. Install the access panel ("Access panel" on page 33).
14. Install the power supplies ("AC power supply" on page 40).
15. Power up the server.

After you replace the system board, you must re-enter the server serial number and the product ID.

1. During the server startup sequence, press the **F9** key to access RBSU.
2. Select the **Advanced Options** menu.

3. Select **Service Options**.
4. Select **Serial Number**. The following warning appears:

   ```
   Warning: The serial number should ONLY be modified by qualified service
   personnel. This value should always match the serial number located on the
   chassis.
   ```

5. Press the **Enter** key to clear the warning.
6. Enter the serial number and press the **Enter** key.
7. Select **Product ID**. The following warning appears:

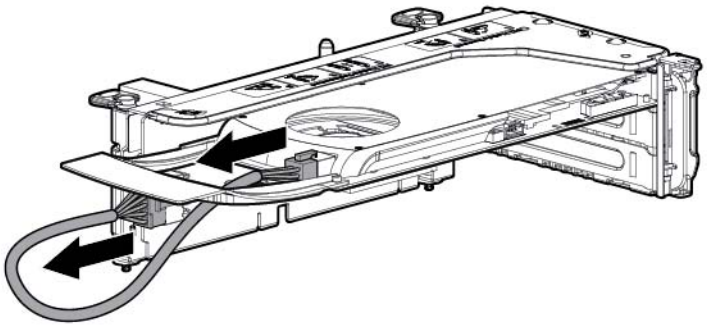
   ```
   Warning: The Product ID should ONLY be modified by qualified service
   personnel. This value should always match the Product ID located on the
   chassis.
   ```

8. Enter the product ID and press the **Enter** key.
9. Press the **Esc** key to close the menu.
10. Press the **Esc** key to exit RBSU.
11. Press the **F10** key to confirm exiting RBSU. The server automatically reboots.

150W PCIe power cable option

> ⚠ **WARNING:** To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

Disconnect the cable as indicated.



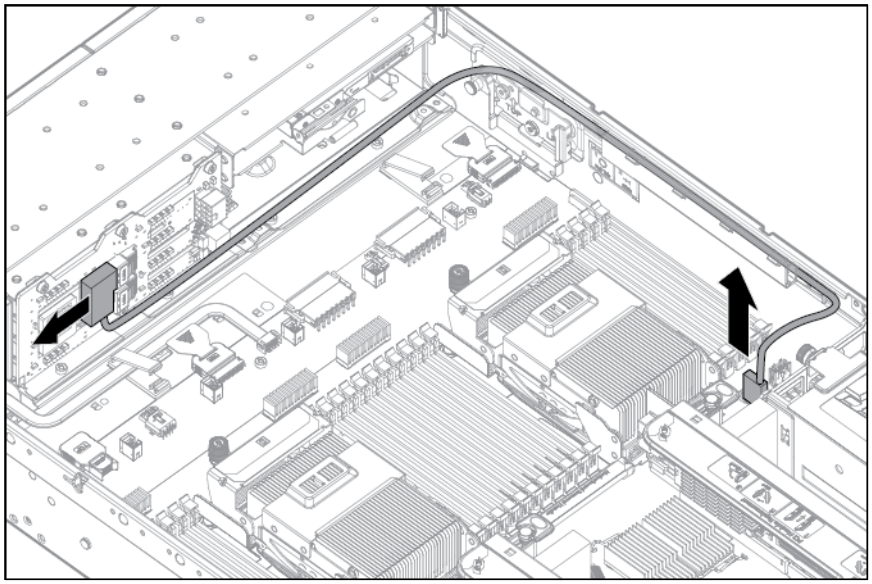
To replace the component, reverse the removal procedure.

Chipset SATA cable option

To remove the component:

1. Power down the server (on page 27).

2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Extend ("Extend the server from the rack" on page 28) or remove ("Remove the server from the rack" on page 29) the server from the rack.
4. Remove the access panel ("Access panel" on page 33).
5. Remove the air baffle ("Air baffle" on page 34).
6. Remove the fan cage ("Fan cage" on page 45).
7. Disconnect the Chipset SATA cable from the system board and the hard drive backplane and remove from the cable guide.



To replace the component, reverse the removal procedure.

HP Trusted Platform Module

The TPM is not a customer-removable part.

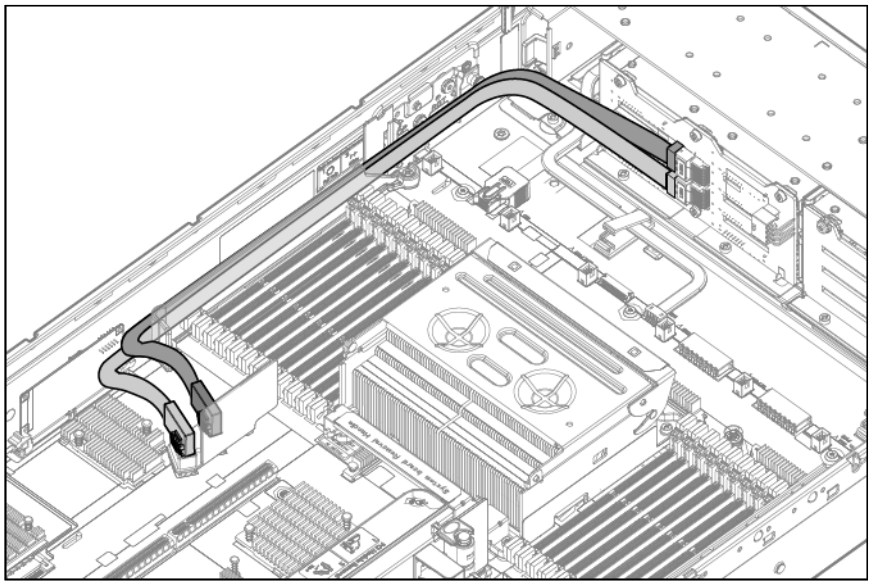
> **CAUTION:** Any attempt to remove an installed TPM from the system board breaks or disfigures the TPM security rivet. Upon locating a broken or disfigured rivet on an installed TPM, administrators should consider the system compromised and take appropriate measures to ensure the integrity of the system data.

If you suspect a TPM board failure, leave the TPM installed and remove the system board. Contact an HP authorized service provider for a replacement system board and TPM board.

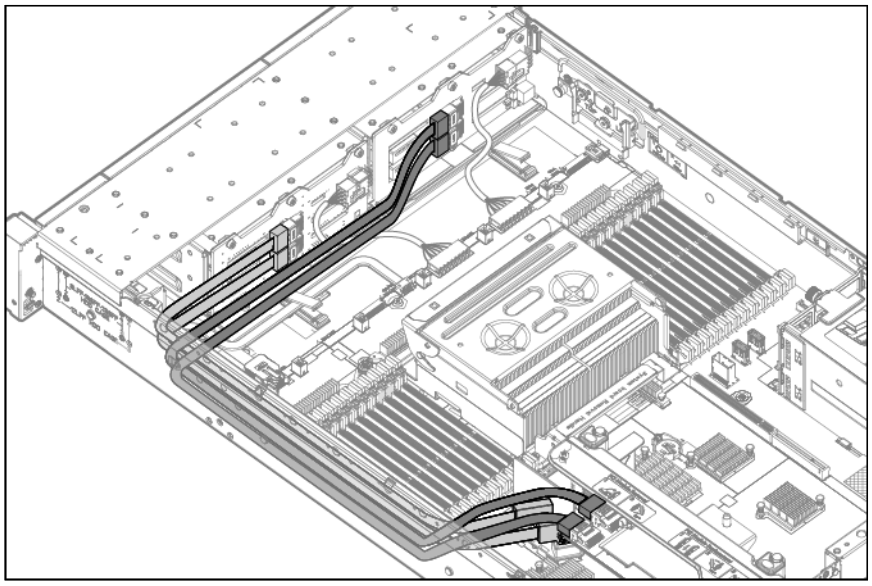
Cabling

SAS hard drive cabling

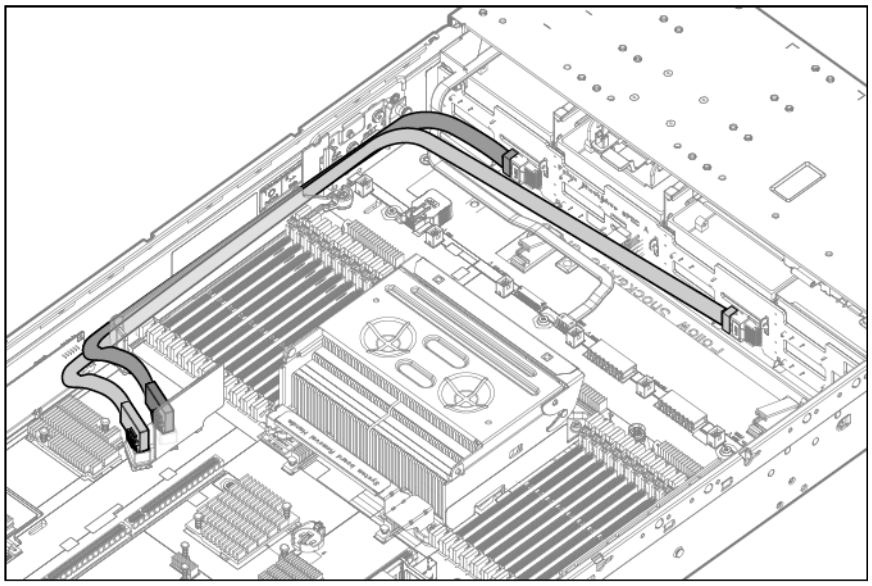
- SFF hard drive cabling



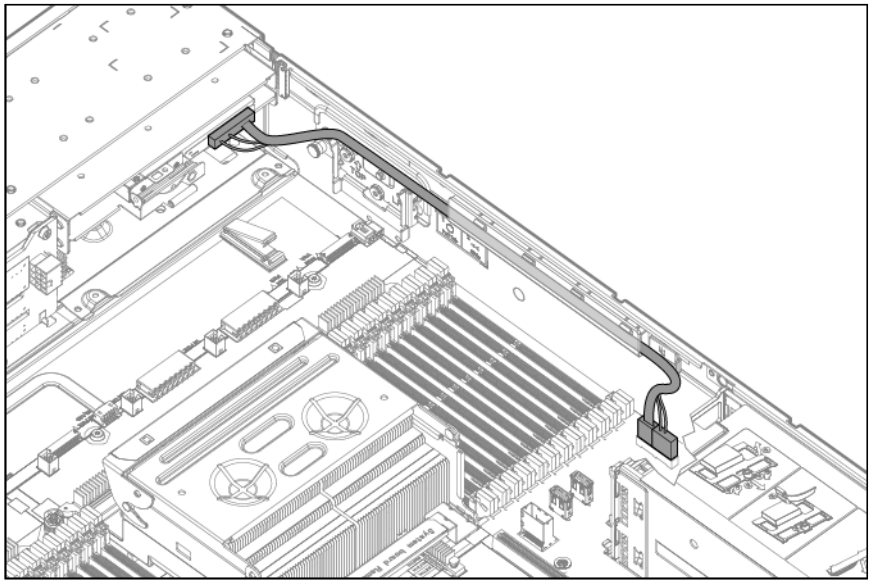
- SFF cabling, with optional drive cage



- LFF hard drive cabling

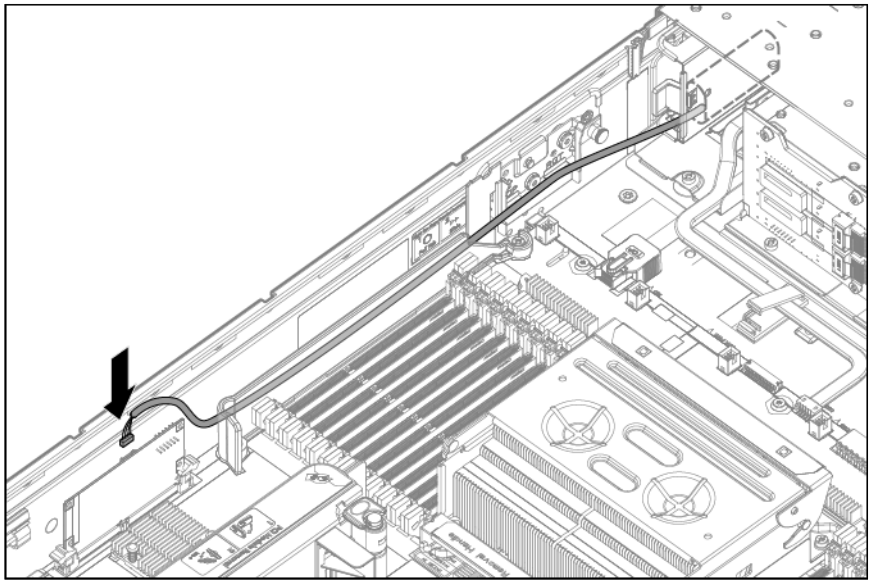


Optical drive cabling

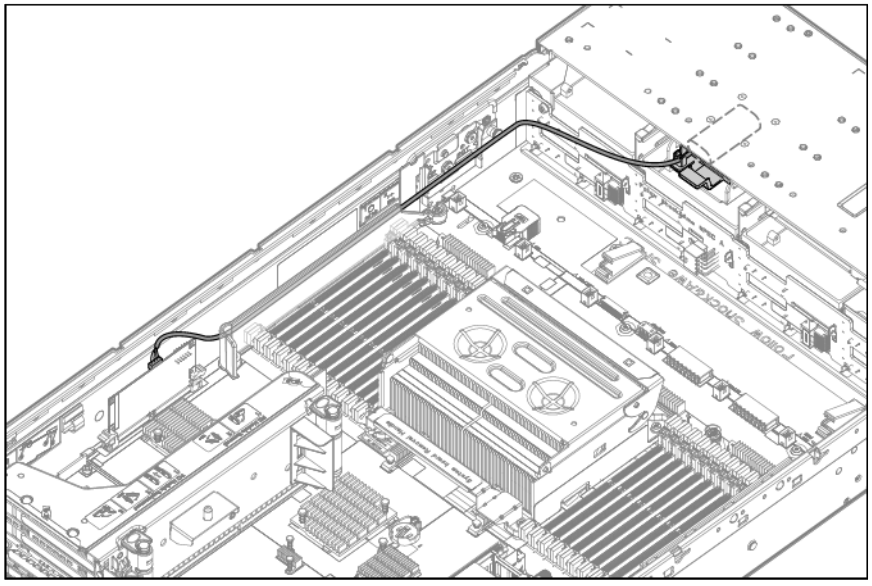


FBWC cabling

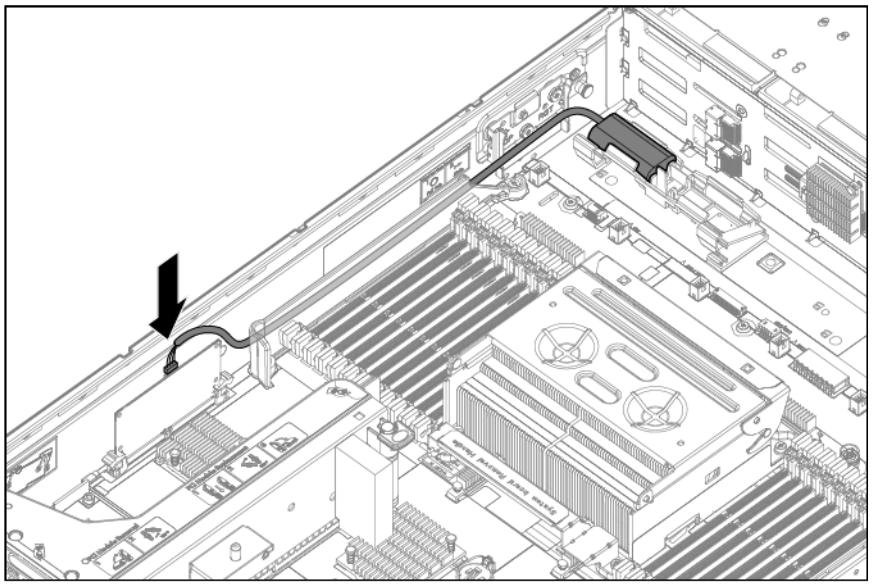
- 8 or 16 drive SFF



- 8 drive LFF

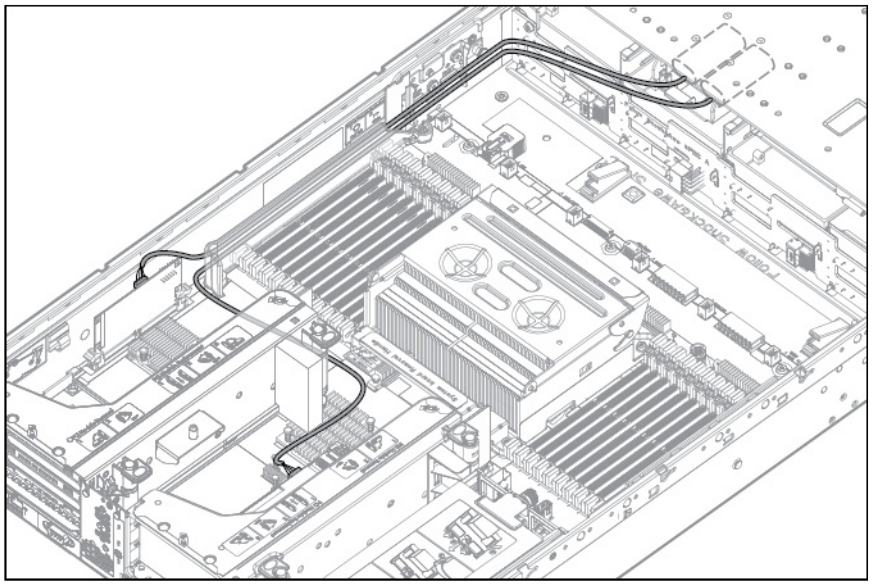


- 12 LFF or 25 SFF



- PCIe option

  Depending on the server configuration, you may need to remove the primary PCIe riser cage (on page 36) before cabling to a PCIe expansion board.



Diagnostic tools

Troubleshooting resources

The *HP ProLiant Gen8 Troubleshooting Guide, Volume I: Troubleshooting* provides procedures for resolving common problems and comprehensive courses of action for fault isolation and identification, issue resolution, and software maintenance on ProLiant servers and server blades. To view the guide, select a language:

- English (http://www.hp.com/support/ProLiant_TSG_v1_en)
- French (http://www.hp.com/support/ProLiant_TSG_v1_fr)
- Spanish (http://www.hp.com/support/ProLiant_TSG_v1_sp)
- German (http://www.hp.com/support/ProLiant_TSG_v1_gr)
- Japanese (http://www.hp.com/support/ProLiant_TSG_v1_jp)
- Simplified Chinese (http://www.hp.com/support/ProLiant_TSG_v1_sc)

The *HP ProLiant Gen8 Troubleshooting Guide, Volume II: Error Messages* provides a list of error messages and information to assist with interpreting and resolving error messages on ProLiant servers and server blades. To view the guide, select a language:

- English (http://www.hp.com/support/ProLiant_EMG_v1_en)
- French (http://www.hp.com/support/ProLiant_EMG_v1_fr)
- Spanish (http://www.hp.com/support/ProLiant_EMG_v1_sp)
- German (http://www.hp.com/support/ProLiant_EMG_v1_gr)
- Japanese (http://www.hp.com/support/ProLiant_EMG_v1_jp)
- Simplified Chinese (http://www.hp.com/support/ProLiant_EMG_v1_sc)

HP Insight Diagnostics

HP Insight Diagnostics is a proactive server management tool, available in both offline and online versions, that provides diagnostics and troubleshooting capabilities to assist IT administrators who verify server installations, troubleshoot problems, and perform repair validation.

HP Insight Diagnostics Offline Edition performs various in-depth system and component testing while the OS is not running. To run this utility, boot the server using Intelligent Provisioning.

HP Insight Diagnostics Online Edition is a web-based application that captures system configuration and other related data needed for effective server management. Available in Microsoft Windows and Linux versions, the utility helps to ensure proper system operation.

For more information or to download the utility, see the HP website (http://www.hp.com/servers/diags). HP Insight Diagnostics Online Edition is also available in the SPP. For more information, see the HP website (http://www.hp.com/go/spp/download).

HP Insight Diagnostics survey functionality

HP Insight Diagnostics (on page 79) provides survey functionality that gathers critical hardware and software information on ProLiant servers.

This functionality supports operating systems that are supported by the server. For operating systems supported by the server, see the HP website (http://www.hp.com/go/supportos).

If a significant change occurs between data-gathering intervals, the survey function marks the previous information and overwrites the survey data files to reflect the latest changes in the configuration.

Survey functionality is installed with every Intelligent Provisioning-assisted HP Insight Diagnostics installation, or it can be installed through the SPP.

HP ROM-Based Setup Utility

RBSU is a configuration utility embedded in ProLiant servers that performs a wide range of configuration activities that can include the following:

- Configuring system devices and installed options
- Enabling and disabling system features
- Displaying system information
- Selecting the primary boot controller
- Configuring memory options
- Language selection

For more information on RBSU, see the *HP ROM-Based Setup Utility User Guide* on the Documentation CD or the HP website (http://www.hp.com/support/rbsu).

Integrated Management Log

The IML records hundreds of events and stores them in an easy-to-view form. The IML timestamps each event with 1-minute granularity.

You can view recorded events in the IML in several ways, including the following:

- From within HP SIM
- From within operating system-specific IML viewers
  - For Windows: IML Viewer
  - For Linux: IML Viewer Application
- From within the HP iLO user interface
- From within HP Insight Diagnostics (on page 79)

USB support and functionality

USB support

HP provides both standard USB 2.0 support and legacy USB 2.0 support. Standard support is provided by the OS through the appropriate USB device drivers. Before the OS loads, HP provides support for USB devices through legacy USB support, which is enabled by default in the system ROM.

Legacy USB support provides USB functionality in environments where USB support is not available normally. Specifically, HP provides legacy USB functionality for the following:

- POST
- RBSU
- Diagnostics
- DOS
- Operating environments which do not provide native USB support

Internal USB functionality

An internal USB connector is available for use with security key devices and USB drive keys. This solution provides for use of a permanent USB key installed in the internal connector, avoiding issues of clearance on the front of the rack and physical access to secure data.

External USB functionality

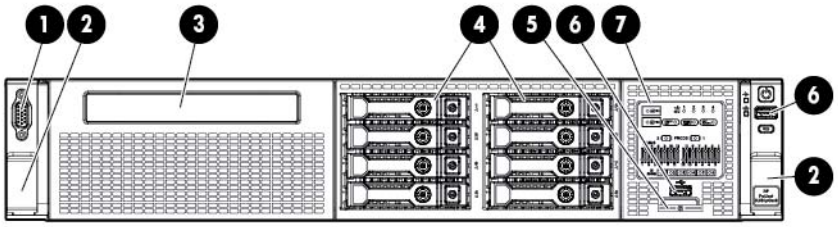
HP provides external USB support to enable local connection of USB devices for server administration, configuration, and diagnostic procedures.

For additional security, external USB functionality can be disabled through RBSU.

Component identification

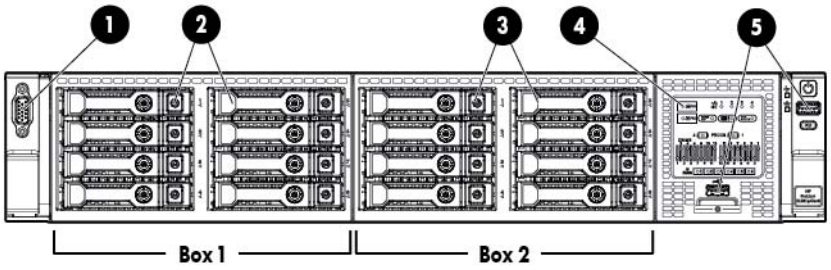
Front panel components

- 8 drive SFF configuration



Item	Description
1	Video connector
2	Quick release levers (2)
3	SATA optical drive bay
4	SFF drive bays
5	Serial number label
6	USB connectors (2)
7	Systems Insight Display

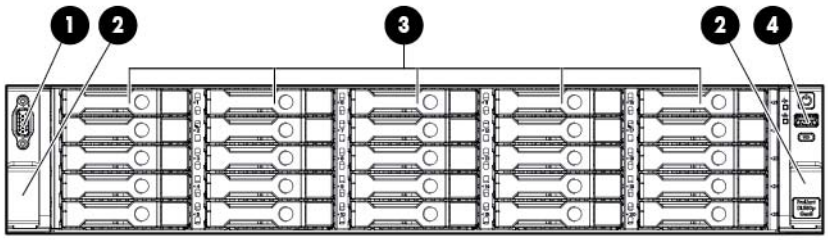
- 16 drive SFF configuration (with optional drive cage)



Item	Description
1	Video connector

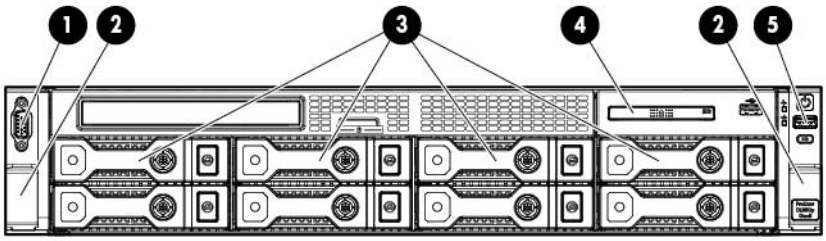
Item	Description
2	Drive bays (box 1)
3	Drive bays (box 2)
4	Systems Insight Display
5	USB connectors (2)

- 25 SFF drive configuration



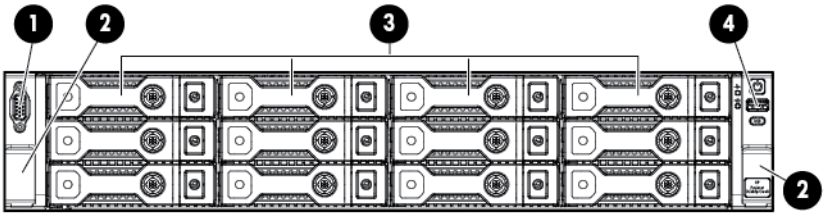
Item	Description
1	Video connector
2	Quick release levers (2)
3	Drive bays
4	USB connector

- 8 drive LFF configuration



Item	Description
1	Video connector
2	Quick release levers (2)
3	Drive bays
4	Systems Insight Display
5	USB connector

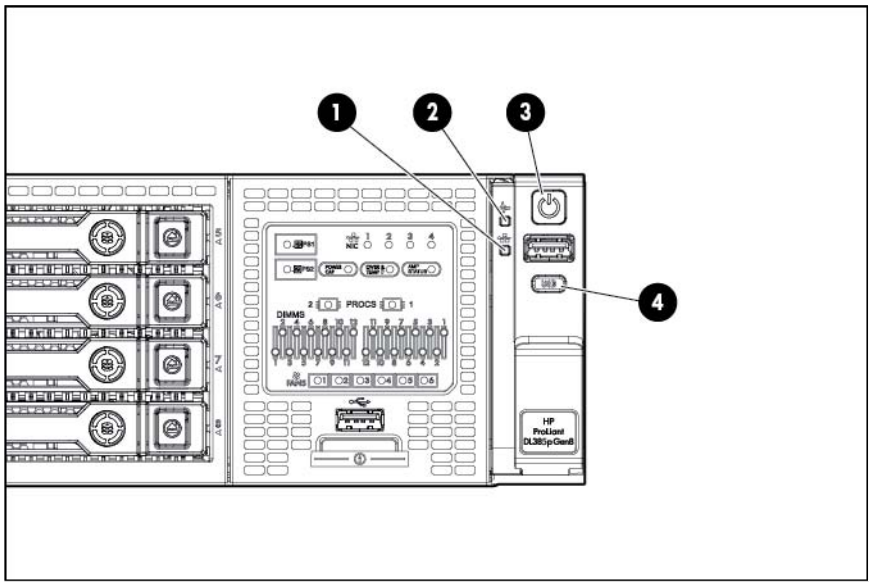
- 12 drive LFF configuration



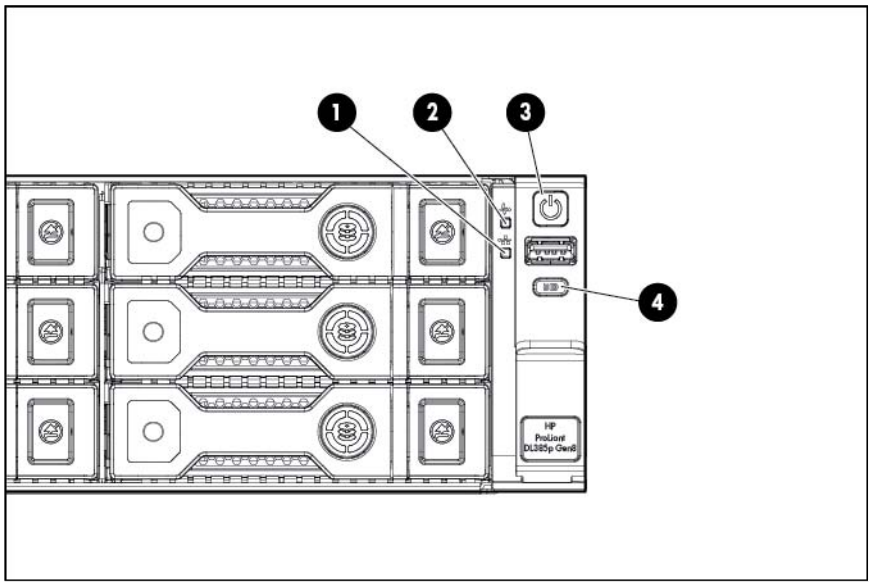
Item	Description
1	Video connector
2	Quick release levers (2)
3	Drive bays
4	USB connector

Front panel LEDs and buttons

- SFF



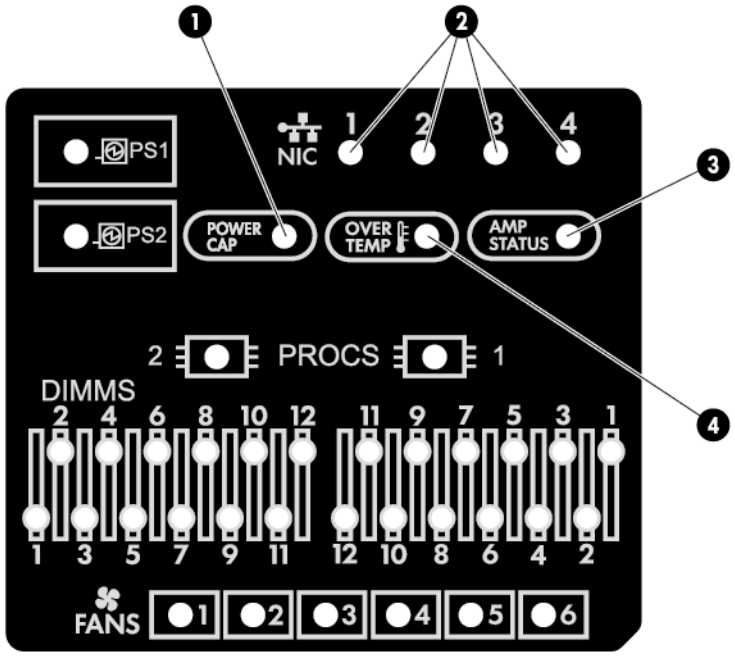
- LFF



Item	Description	Status
1	NIC status LED	Off = No network link Solid green = Link to network Flashing green = Network activity
2	Health LED	Solid Green = Normal Flashing Amber = System degraded Flashing Red = System critical To identify components in degraded or critical state, see "Systems Insight Display LEDs (on page 86)."
3	Power On/Standby button and system power LED	Off = Power cord not attached or power supply failure Solid Amber = System is in standby; Power On/Standby Button service is initialized. Flashing Green = Power On/Standby Button has been pressed; waiting for server to power on. Solid Green = System on
4	UID LED and button	Off = Deactivated Solid Blue = Activated Flashing Blue = System being remotely managed

Systems Insight Display LEDs

The HP Systems Insight Display LEDs represent the system board layout. The display, available on 8 SFF, 16 SFF, and 8 LFF configurations, enables diagnosis with the access panel installed.



Item	Description	Status
1	Power cap	Off = System is in standby, or no cap is set. Solid green = Power cap applied
2	NIC link/activity	Off = No link to network. If the power is off, view the rear panel RJ-45 LEDs for status ("Rear panel LEDs and buttons" on page 88). Flashing green = Network link and activity Solid green = Network link
3	AMP status	Off = AMP modes disabled Solid green = AMP mode enabled Solid amber = Failover Flashing amber = Invalid configuration
4	Over temp	Off = Normal Solid amber = High system temperature detected
—	All other LEDs	Off = Normal Amber = Failure For more information on the activation of these LEDs, see "Systems Insight Display LED combinations (on page 87)."

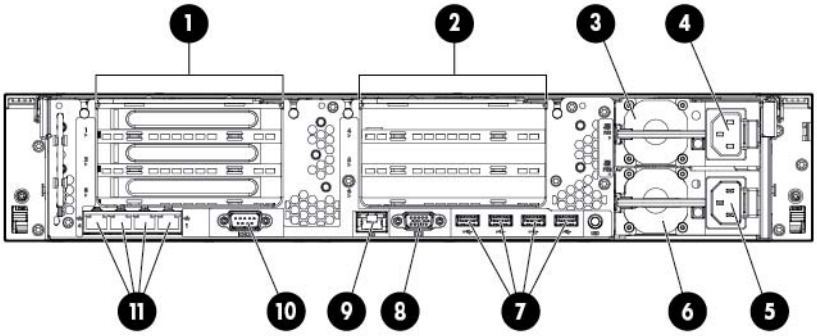
Systems Insight Display LED combinations

When the health LED on the front panel illuminates either amber or red, the server is experiencing a health event. Combinations of illuminated Systems Insight Display LEDs, the system power LED, and the health LED indicate system status.

Systems Insight Display LED and color	Health LED	System power LED	Status
Processor (amber)	Red	Amber	One or more of the following conditions may exist: • Processor in socket *X* has failed. • Processor *X* is not installed in the socket. • Processor *X* is unsupported. • ROM detects a failed processor during POST.
Processor (amber)	Amber	Green	Processor in socket *X* is in a pre-failure condition.
DIMM (amber)	Red	Green	One or more DIMMs have failed.
DIMM (amber)	Amber	Green	DIMM in slot *X* is in a pre-failure condition.
Over temp (amber)	Amber	Green	The Health Driver has detected a cautionary temperature level.
Over temp (amber)	Red	Amber	The server has detected a hardware critical temperature level.
Fan (amber)	Amber	Green	One fan has failed or has been removed.
Fan (amber)	Red	Green	Two or more fans have failed or been removed.
Power supply (amber)	Red	Amber	One or more of the following conditions may exist: • Only one power supply is installed and that power supply is in standby. • Power supply fault • System board fault
Power supply (amber)	Amber	Green	One or more of the following conditions may exist: • Redundant power supply is installed and only one power supply is functional. • AC power cord is not plugged into redundant power supply. • Redundant power supply fault • Power supply mismatch at POST or power supply mismatch through hot-plug addition
Power cap (off)	—	Amber	Standby
Power cap (off)	—	Flashing green	Waiting for power
Power cap (off)	—	Green	Power is available.

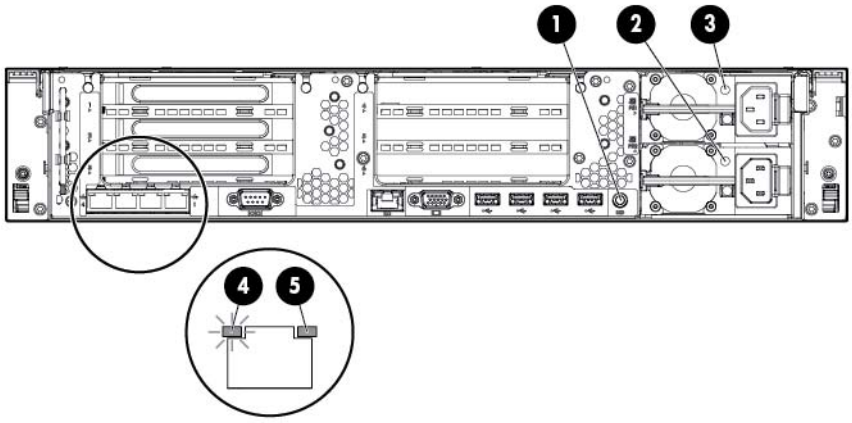
IMPORTANT: If more than one DIMM slot LED is illuminated, further troubleshooting is required. Test each bank of DIMMs by removing all other DIMMs. Isolate the failed DIMM by replacing each DIMM in a bank with a known working DIMM.

Rear panel components



Item	Description
1	PCIe slots 1–3 (top to bottom)
2	PCIe slots 4–6, optional (top to bottom)
3	Power supply 1 (PS1)
4	PS1 power connector
5	PS2 power connector, optional
6	Power supply 2 (PS2), optional
7	USB connectors (4)
8	Video connector
9	iLO connector
10	Serial connector
11	FlexibleLOM ports (Shown: 4x1Gb/Optional: 2x10Gb); port 1 on right side

Rear panel LEDs and buttons



Item	Description	Status
1	UID LED/button	Off = Deactivated Solid blue = Activated Flashing blue = System being managed remotely

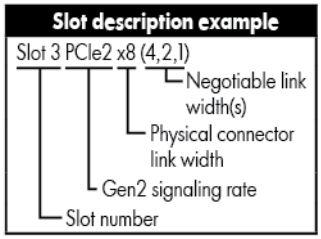
Item	Description	Status
2	Power supply 2 LED	Off = System is off or power supply has failed. Solid green = Normal
3	Power supply 1 LED	Off = System is off or power supply has failed. Solid green = Normal
4	NIC activity LED	Off = No network activity Solid green = Link to network Flashing green = Network activity
5	NIC link LED	Off = No network link Green = Network link

Non-hot-plug PCIe riser board slot definitions

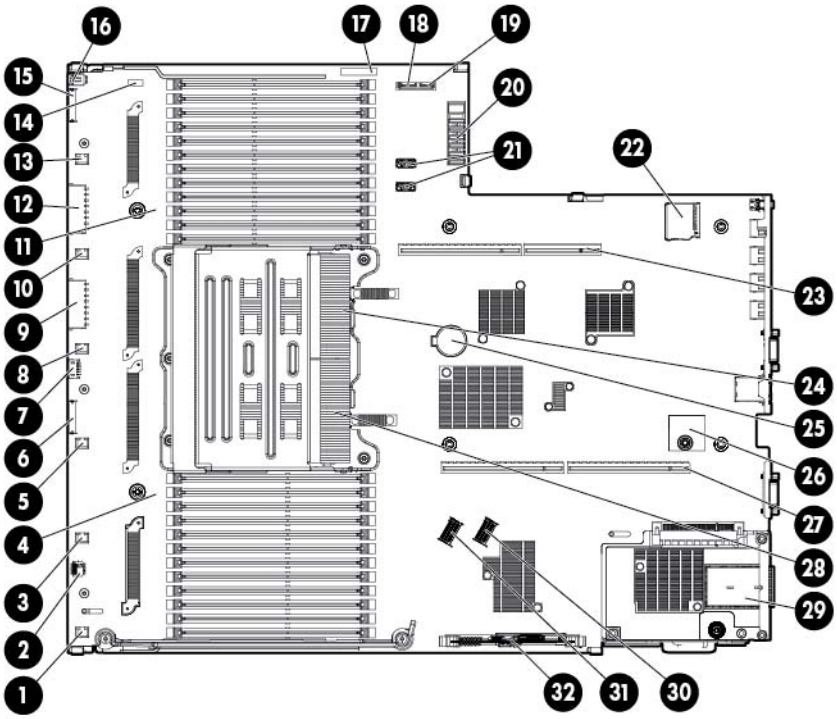
Primary Slot - form factor	PCIe 2 riser slot description	Secondary Slot - form factor	PCIe 2 x16 riser slot description
1 - FL/FH	PCIe2 x16 (8,4,1)	4 - FL/FH	PCIe2 x16 (16, 8, 4, 1)
2 - HL/FH	PCIe2 x8 (8,4,1)	5 - HL/FH	PCIe2 x16 (8, 4, 1)
3 - HL/FH	PCIe2 x8 (4,1)	6 - HL/FH	PCIe2 x8 (8, 4, 1)

Notes:

- "Primary" denotes the riser cage is installed in the primary riser connector.
- "Secondary" denotes the riser cage is installed in the secondary riser connector.
- Installing the riser cages listed in the table above in either the primary or secondary riser connectors determines the form factor of the PCI cards supported by those riser cages.
- FL/FH denotes full-length, full-height. HL/FH denotes half-length, full-height. LP denotes low profile.
- The riser cages support a maximum power of 150 W with an HP power cable. This cable must be used for PCIe card wattages greater than 75 W.



System board components



Item	Description
1	Fan connector 6
2	Systems Insight Display connector
3	Fan connector 5
4	Processor 1 DIMM slots
5	Fan connector 4
6	Front I/O connector
7	Front USB connector
8	Fan connector 3
9	First drive cage
10	Fan connector 2
11	Processor 2 DIMM slots
12	Second drive cage
13	Fan connector 1
14	NMI jumper
15	Front video connector
16	Discovery services connector
17	System maintenance switch
18	SATA optical drive connector
19	SATA drive port 1
20	Power supply backplane connector
21	USB connector

Item	Description
22	SD card slot
23	Secondary (processor 2) PCIe riser connector
24	Processor 2 socket
25	System battery
26	TPM connector
27	Primary (processor 1) PCIe riser connector
28	Processor 1 socket
29	FlexibleLOM
30	SAS port 1i
31	SAS port 2i
32	SAS cache module connector

System maintenance switch

Position	Default	Function
S1	Off	Off = HP iLO security is enabled. On = HP iLO security is disabled.
S2	Off	Off = System configuration can be changed. On = System configuration is locked.
S3	Off	Reserved
S4	Off	Reserved
S5	Off	Off = Power-on password is enabled. On = Power-on password is disabled.
S6	Off	Off = No function On = ROM reads system configuration as invalid.
S7	—	Reserved
S8	—	Reserved
S9	—	Reserved
S10	—	Reserved
S11	—	Reserved
S12	—	Reserved

To access redundant ROM, set S1, S5, and S6 to on.

When the system maintenance switch position 6 is set to the On position, the system is prepared to erase all system configuration settings from both CMOS and NVRAM.

△ **CAUTION:** Clearing CMOS and/or NVRAM deletes configuration information. Be sure to properly configure the server or data loss could occur.

NMI functionality

An NMI crash dump enables administrators to create crash dump files when a system is hung and not responding to traditional debug mechanisms.

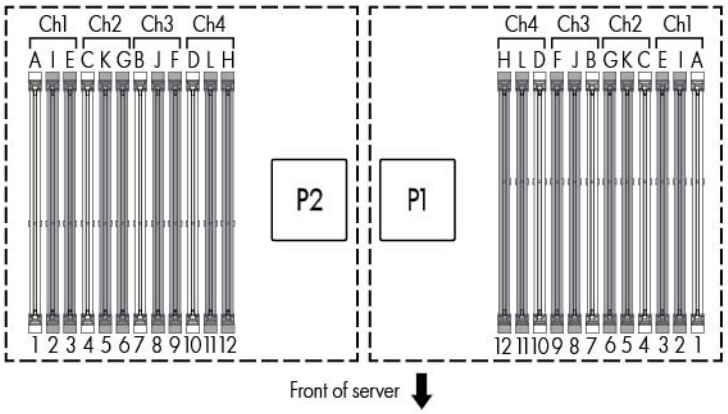
Crash dump log analysis is an essential part of diagnosing reliability problems, such as hangs in operating systems, device drivers, and applications. Many crashes freeze a system, and the only available action for administrators is to cycle the system power. Resetting the system erases any information that could support problem analysis, but the NMI feature preserves that information by performing a memory dump before a hard reset.

To force the OS to invoke the NMI handler and generate a crash dump log, the administrator can use the iLO Virtual NMI feature.

For more information, see the white paper on the HP website (http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00797875/c00797875.pdf).

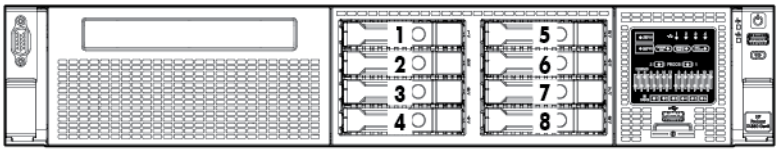
DIMM slot locations

DIMM slots are numbered sequentially (1 through 12) for each processor. The supported AMP modes use the letter assignments for population guidelines.

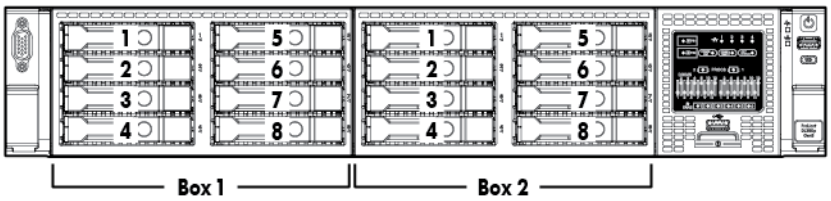


SAS and SATA device numbers

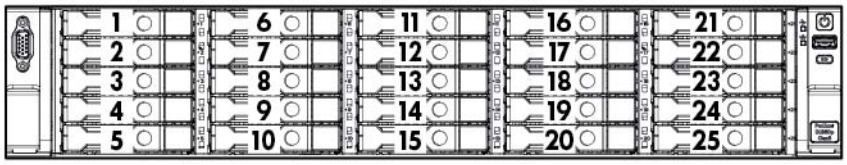
- 8 SFF device bay numbering



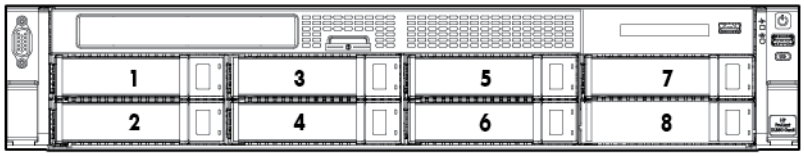
- 16 SFF device bay numbering



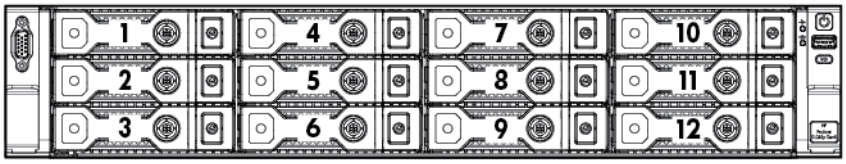
- 25 SFF device bay numbering



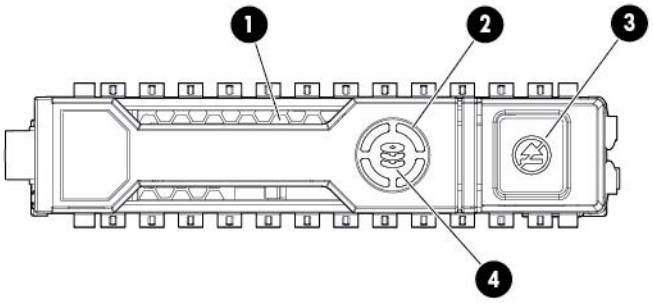
- 8 LFF device bay numbering



- 12 LFF device bay numbering



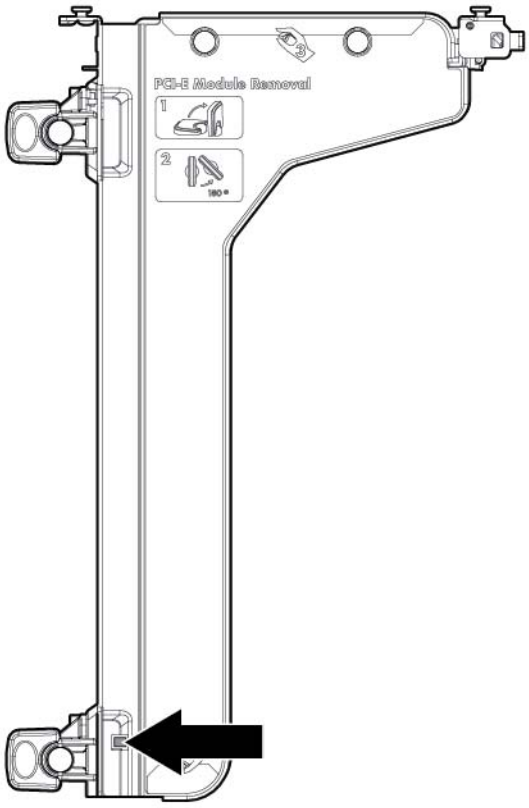
Drive LED definitions



Item	LED	Status	Definition
1	Locate	Solid blue	The drive is being identified by a host application.
		Flashing blue	The drive carrier firmware is being updated or requires an update.
2	Activity ring	Rotating green	Drive activity
		Off	No drive activity
3	Do not remove	Solid white	Do not remove the drive. Removing the drive causes one or more of the logical drives to fail.
		Off	Removing the drive does not cause a logical drive to fail.
4	Drive status	Solid green	The drive is a member of one or more logical drives.
		Flashing green	The drive is rebuilding or performing a RAID migration, stripe size migration, capacity expansion, or logical drive extension, or is erasing.
		Flashing amber/green	The drive is a member of one or more logical drives and predicts the drive will fail.
		Flashing amber	The drive is not configured and predicts the drive will fail.
		Solid amber	The drive has failed.
		Off	The drive is not configured by a RAID controller.

PCIe riser cage LED

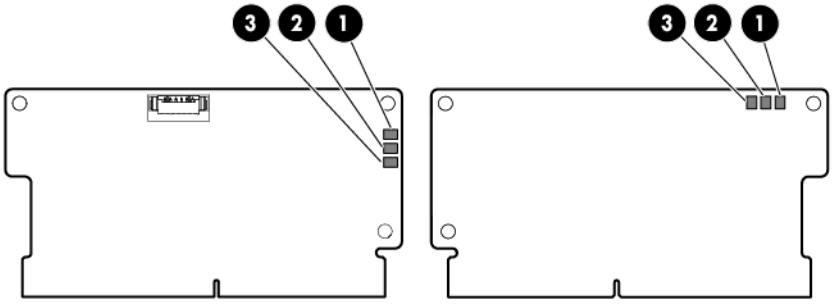
△ **CAUTION:** To prevent damage to the server or expansion boards, power down the server and remove all AC power cords before removing or installing the PCIe riser cage.



Status
On = AC power is connected.
Off = AC power is disconnected.
Missing = Riser cage is not installed, or power might not be connected.

FBWC module LEDs (P222, P420, P421)

The FBWC module has three single-color LEDs (one amber and two green). The LEDs are duplicated on the reverse side of the cache module to facilitate status viewing.



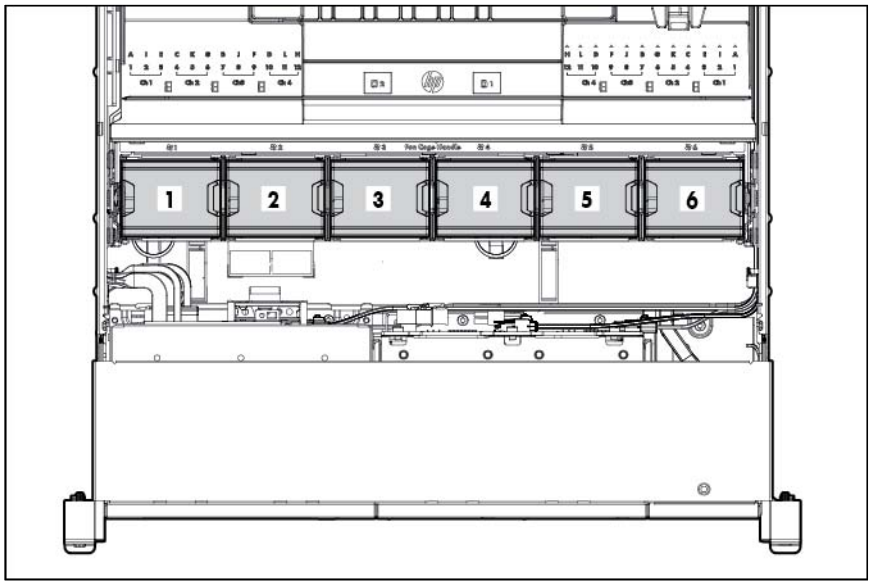
1 - Amber	2 - Green	3 - Green	Interpretation
Off	Off	Off	The cache module is not powered.
Off	Flashing 0.5 Hz	Flashing 0.5 Hz	The cache microcontroller is executing from within its boot loader and receiving new flash code from the host controller.
Off	Flashing 1 Hz	Flashing 1 Hz	The cache module is powering up, and the capacitor pack is charging.
Off	Off	Flashing 1 Hz	The cache module is idle, and the capacitor pack is charging.
Off	Off	On	The cache module is idle, and the capacitor pack is charged.
Off	On	On	The cache module is idle, the capacitor pack is charged, and the cache contains data that has not yet been written to the drives.
Off	Flashing 1 Hz	Off	A backup is in progress.
Off	On	Off	The current backup is complete with no errors.
Flashing 1 Hz	Flashing 1 Hz	Off	The current backup failed, and data has been lost.
Flashing 1 Hz	Flashing 1 Hz	On	A power error occurred during the previous or current boot. Data may be corrupt.
Flashing 1 Hz	On	Off	An overtemperature condition exists.
Flashing 2 Hz	Flashing 2 Hz	Off	The capacitor pack is not attached.
Flashing 2 Hz	Flashing 2 Hz	On	The capacitor has been charging for 10 minutes, but has not reached sufficient charge to perform a full backup.
On	On	Off	The current backup is complete, but power fluctuations occurred during the backup.
On	On	On	The cache module microcontroller has failed.

Hot-plug fans

CAUTION: To avoid damage to server components, fan blanks must be installed in fan bays 1 and 2 in a single-processor configuration.

The only two valid fan configurations are listed in the following table.

Configuration	Fan bay 1	Fan bay 2	Fan bay 3	Fan bay 4	Fan bay 5	Fan bay 6
1 processor	Fan blank	Fan blank	Fan	Fan	Fan	Fan
2 processors	Fan	Fan	Fan	Fan	Fan	Fan



For a single-processor configuration, four fans and two blanks are required in specific fan bays for redundancy. A fan failure or missing fan causes a loss of redundancy. A second fan failure or missing fan causes an orderly shutdown of the server.

Installing more than the required number of fans in a single-processor configuration is not a supported configuration.

For a dual-processor configuration, six fans are required for redundancy. A fan failure or missing fan causes a loss of redundancy. A second fan failure or missing fan causes an orderly shutdown of the server.

The server supports variable fan speeds. The fans operate at minimum speed until a temperature change requires a fan speed increase to cool the server. The server shuts down during the following temperature-related scenarios:

- At POST and in the OS, HP iLO performs an orderly shutdown if a cautionary temperature level is detected. If the server hardware detects a critical temperature level before an orderly shutdown occurs, the server performs an immediate shutdown.
- When the Thermal Shutdown feature is disabled in RBSU, HP iLO does not perform an orderly shutdown when a cautionary temperature level is detected. Disabling this feature does not disable the server hardware from performing an immediate shutdown when a critical temperature level is detected.

△ **CAUTION:** A thermal event can damage server components when the Thermal Shutdown feature is disabled in RBSU.

Specifications

Environmental specifications

Specification	Value
Temperature range*	
Operating	10°C to 35°C (50°F to 95°F)
Shipping	-30°C to 50°C (-22°F to 122°F)
Storage	-30°C to 60°C (-22°F to 140°F)
Maximum wet bulb temperature	28°C (82.4°F)
Relative humidity (noncondensing)**	
Operating	10% to 90%
Non-operating	5% to 95%

* All temperature ratings shown are for sea level. An altitude derating of 1°C per 300 m (1.8°F per 1,000 ft) to 3048 m (10,000 ft) is applicable. No direct sunlight allowed.
** Storage maximum humidity of 95% is based on a maximum temperature of 45°C (113°F). Altitude maximum for storage corresponds to a pressure minimum of 70 KPa.

Mechanical specifications

Specification	Value
Height	8.73 cm (3.44 in)
Depth, SFF	69.85 cm (27.50 in)
Depth, LFF	74.93 cm (29.5 in)
Width	44.55 cm (17.54 in)
Weight, 8 LFF	22.63-30.19 kg (49.9-65.5 lb)
Weight, 12 LFF	20.02-32.66 kg (44.1-72 lb)
Weight, 8 SFF	23.53-28.08 kg (51.9-61.9 lb)
Weight, 16 SFF	19.92 kg–27.76 kg (43.9 lb–61.2 lb)
Weight, 25 SFF	21.15 kg–28.37 kg (46.6 lb–62.5 lb)

Power supply specifications

Depending on installed options, the server is configured with one of the following power supplies:

- HP 460 W CS Gold power supply (92% efficiency) (on page 99)
- HP 460 W CS Platinum Plus power supply (94% efficiency) (on page 99)
- HP 750 W CS Gold power supply (92% efficiency) (on page 100)

- HP 750 W CS Platinum Plus power supply (94% efficiency) (on page 100)
- HP 750 W 48V CS DC power supply (94% efficiency) (on page 101)
- HP 1200 W CS Platinum Plus power supply (90% efficiency) (on page 101)

For detailed power supply specifications, see the quickspecs on the HP website (http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html).

HP 460 W CS Gold power supply (92% efficiency)

Specification	Value
Input requirements	—
Rated input voltage	100V to 240V AC
Rated input frequency	50 Hz or 60 Hz
Rated input current	5.5A to 2.2A
Rated input power	526 W at 100 V AC input 505 W at 200 V AC input
Btus per hour	1794 at 100 V AC input 1725 at 200 V AC input
Power supply output	—
Rated steady-state power	460 W at 100 V to 120 V AC input 460 W at 200 V to 240 V AC input
Maximum peak power	460 W at 100 V to 120 V AC input 460 W at 200 V to 240 V AC input

HP 460 W CS Platinum Plus power supply (94% efficiency)

Specification	Value
Input requirements	—
Rated input voltage	100V to 240V AC
Rated input frequency	50 Hz or 60 Hz
Rated input current	5.2A to 2.1A
Rated input power	509 W at 115 V AC input 495 W at 230 V AC input
Btus per hour	1764 at 100 V AC 1694 at 200 V AC
Power supply output	—
Rated steady-state power	460 W at 100 V to 120 V AC input 460 W at 200 V to 240 V AC input
Maximum peak power	460 W at 100 V to 120 V AC input 460 W at 200 V to 240 V AC

	input

HP 750 W CS Gold power supply (92% efficiency)

Specification	Value
Input requirements	—
Rated input voltage	100V to 240V AC
Rated input frequency	50 to 60 Hz
Rated input current	8.9A to 3.6A
Rated input power	857 W at 100 V AC input 824 W at 200 V AC input
Btus per hour	2925 at 100 V AC input 2812 at 200 V AC input
Power supply output	—
Rated steady-state power	750 W at 100 V to 120 V AC input 750 W at 200 V to 240 V AC input
Maximum peak power	750 W at 100 V to 120 V AC input 750 W at 200 V to 240 V AC input

HP 750 W CS Platinum Plus power supply (94% efficiency)

Specification	Value
Input requirements	—
Rated input voltage	100V to 240V AC
Rated input frequency	50 Hz to 60 Hz
Rated input current	8.5A to 3.5A
Maximum rated input power	831 W at 115 V AC input 808 W at 230 V AC input
Btus per hour	2878 at 100 V AC 2769 at 200 V AC
Power supply output	—
Rated steady-state power	750 W at 100 V to 120 V AC input 750 W at 200 V to 240 V AC input
Maximum peak power	750 W at 100 V to 120 V AC input 750 W at 200 V to 240 V AC input

HP 750 W 48V CS DC power supply (94% efficiency)

Specification	Value
Input requirements	—
Rated input voltage	-36V to -72V DC -48V DC, nominal input
Rated input frequency	DC
Rated input current	2.3A at -36V DC 12A at -72V DC 17A at -48V DC, nominal input
Rated input power	840 W at -36V DC input 830 W at -72V DC input 820 W at -48V DC, nominal input
Btus per hour	2865 at -36V DC input 2830 at -72V DC input 2796 at -48V DC, nominal input
Power supply output	—
Rated steady-state power	750 W
Rated peak power	750 W

CAUTION: This equipment is designed to permit the connection of the earthed conductor of the DC supply circuit to the earthing conductor at the equipment.
If this connection is made, all of the following must be met:

- This equipment must be connected directly to the DC supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode conductor is connected.
- This equipment must be located in the same immediate area (such as adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, and also the point of earthing of the DC system. The DC system must be earthed elsewhere.
- The DC supply source is to be located within the same premises as the equipment.
- Switching or disconnecting devices must not be in the earthed circuit conductor between the DC source and the point of connection of the earthing electrode conductor.

CAUTION: To reduce the risk of electric shock or energy hazards:

- This equipment must be installed by trained service personnel, as defined by the NEC and IEC 60950-1, Second Edition, the standard for Safety of Information Technology Equipment.
- Connect the equipment to a reliably grounded SELV source. An SELV source is a secondary circuit that is designed so normal and single fault conditions do not cause the voltages to exceed a safe level (60 V DC).
- The branch circuit overcurrent protection must be rated 24 A.

HP 1200 W CS Platinum Plus Power Supply (90% efficiency)

Specification	Value
Input requirements	—
Rated input voltage	100V AC to 240V AC

Rated input frequency	50 Hz to 60 Hz
Rated input current	9.1A to 5.5A
Maximum rated input power	897 W at 100V AC input 1321 W at 200V AC input
Btus per hour	3061 at 100V AC input 4506 at 200V AC input
Power supply output	—
Rated steady-state power	800 W at 100V AC input 900 W at 120V AC input 1200 W at 200V to 240V AC input
Maximum peak power	800 W at 100V AC input 900 W at 120V AC input 1200 W at 200V to 240V AC input

Acronyms and abbreviations

DDR

double data rate

FBWC

flash-backed write cache

iLO

Integrated Lights-Out

IML

Integrated Management Log

NMI

nonmaskable interrupt

NVRAM

nonvolatile memory

PCIe

peripheral component interconnect express

POST

Power-On Self Test

RBSU

ROM-Based Setup Utility

SAS

serial attached SCSI

SATA

serial ATA

SR

semi-rigid

STR

straight (connector)

TPM

Trusted Platform Module

UID

unit identification

USB

universal serial bus

Documentation feedback

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